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THE SPECIFIC GRAVITY OF HEALTHY MEN

BODY WEIGHT ÷ VOLUME AS AN INDEX OF OBESITY

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The fundamental biologic determination of corporeal specific gravity, essentially a relationship between weight and unit volume, has been neglected in the modern classification of healthy persons. Stern [1] and Spivak [2] emphasized the value of the measurement of corporeal density, but their experimental data are not conclusive. Of especial interest is the relationship between specific gravity and the fat content of the body.

The presence of an indeterminate amount of excess adipose tissue renders difficult any precise computation, for example, of metabolic rate or dosage of drugs in terms of total body weight. The important consideration should be the weight of the lean body representing the active mass of protoplasm.

In this paper the data support the concept that the comparatively low specific gravity of fat makes the measurement of the specific gravity of the body mass valid for the estimation of fat content.

The comprehensive, statistical analysis of Boyd,[3] however, covering seven hundred and eighty-seven values reported since 1906 does not permit a classification of individuals with respect to obesity. The analyzed results,[3] moreover, obtained by different investigators elude comparison by reason of the unknown quantity of air present in the lungs when the measurements were made.

In the present investigation the values of specific gravity obtained on ninety-nine healthy naval men in the 20 to 40 year age group were corrected by determining the residual air volume. The results obtained permit the classification of individuals as to degree of obesity and serve as a single index of physical fitness to supplement the standard age-height-weight tables which frequently lead to a designation of overweight for well developed men in contrast with a designation of normal weight for more obese individuals who fall into a lower weight group.

The material in this article should be construed only as the personal opinion of the writers and not as representing the opinion of the Navy Department officially.

1. Stern, H.: Investigations on Corporeal Specific Gravity and on the Value of This Factor in Physical Diagnosis, M. Rec. 59: 204-207, 1901.

2. Spivak, C. D.: The Specific Gravity of the Human Body, Arch. Int. Med. 18: 628-642 (April) 1915.

3. Boyd, Edith: The Specific Gravity of the Human Body, Human Biology 5: 646-672 (Dec.) 1933.

METHOD OF PROCEDURE

The essential measurement is that of body volume, which, based on Archimedes' principle, can be conveniently determined by the method of hydrostatic weighing, i. e. equivalent volume = weight in air − weight in water. The weight in water is determined by suspending a subject below the surface of the water on a line leading up to a spring scale graduated in ounces. A weighted lead belt maintains negative buoyancy for all types of persons.

Two weighings in water serve to check the accuracy of the procedure: one at the completion of maximum inspiration and the other at the end of maximum expiration.

The difference in weight obtained records hydrostatic displacement, which serves as a measure of vital capacity. This determination of vital capacity when corrected for the effect of the mean hydrostatic pressure on thoracic volume gives values comparable to those obtained by the standard method employing spirometry.

In the determination of residual air, the inhalation of a helium-oxygen mixture for a period of three minutes following maximal expiration brought about a removal of the residual nitrogen. The subsequent washing out during normal respiration of the previously inhaled helium with 50 liters of air or oxygen permitted an accurate computation of residual pulmonary volume comparable to unpublished results obtained by Willmon and Behnke using the nitrogen dilution method. Duplicate determinations usually gave values which differed by not more than 150 cc.

CIRCUMFERENTIAL MEASUREMENTS OF CHEST AND ABDOMEN

The circumferential measurements of the chest and the abdomen are subject to considerable variation unless special care is exercised. The values recorded were obtained usually in the midmorning, during quiet respiration and with the arms of the subject extended vertically. Under these circumstances errors arising from altered muscular tonus or voluntary retraction of the abdomen were minimized. The chest measurement was made at the level of the nipples, the abdominal measurement at the level of the umbilicus.

SOURCES OF ERROR

The greatest error arises from the determination of residual lung volume. If the variation in this measurement is of the order of 200 cc., values for specific gravity will be subject to an error of ± 0.003.

Repeated determinations on the same individual permitting the use of a constant volume for residual air give values that agree to within 0.003.

A second error may arise from the presence of gas in the abdominal viscera. In an attempt to minimize this error, determinations were made in the morning on the fasting individual.

TABLE 1.—*Example Illustrating the Method of Computing Specific Gravity*

	Pounds	Kilograms
Weight of the body in air	183.80	83.30
Weight in water, full inspiration	14.30	6.45
Weight in water, complete expiration	23.30	10.55
Vital capacity computed from the volume of water displaced	4,690 cc.	
Vital capacity by spirometric measurements	4,110 cc.	
Volume of residual air	1,580 cc.	
Weight of abdominal belt	13.75	6.25
Corrections		
Gross weight in water	23.30	10.55
Weight of belt	13.75	6.25
Weight in water, not corrected for residual air	9.45	4.30
Correction for residual air (1,200/455)	2.65	1.20
Net weight in water	12.10	5.50

$$\text{Specific gravity} = \frac{\text{Weight}}{\text{Volume}} = \frac{183}{170.9} = 1.071$$

RESULTS OBTAINED

In table 4 are listed values obtained on ninety-nine healthy men in military service. From analysis of the data, two facts are apparent: 1. Specific gravity increases inversely in relation to weight. 2. The difference between abdominal and thoracic girth can be correlated with specific gravity.

In table 2 the values for residual air indicate that any error in the determinations will not appreciably alter the relative classification of the subjects with respect to specific gravity. It is apparent that the range of values for residual air is large so that any individual measurement of specific gravity must be accompanied by an actual determination of residual air. For groups of twenty or more men, however, when average values are compared, an arbitrary figure of 1,450 cc. for residual pulmonary volume will not introduce an error greater than ± 0.003 in the computation of specific gravity.

TABLE 2.—*Residual Air and Vital Capacity Values*

Specific Gravity	Number of Men	Average Residual Air, Liters	Residual Air, Range	Average Vital Capacity, Liters	Vital Capacity, Range
1.080-1.089	2	1.315	1.312-1.317	4.350	4.160-4.600
1.090-1.099	2	1.357	1.200-1.513	4.125	4.100-4.150
1.040-1.049	4	1.121	0.950-1.488	4.575	3.700-5.000
1.050-1.059	20	1.505	1.080-2.300	4.800	3.575-6.000
1.060-1.069	22	1.179	0.707-1.643	4.757	3.975-6.005
1.070-1.079	27	1.504	0.858-2.650	4.820	3.975-6.200
1.080-1.089	14	1.379	0.705-2.128	5.021	4.400-5.750
1.090-1.099	7	1.730	1.098-2.204	5.085	4.250-5.970

In table 3 the ninety-nine subjects are divided into three groups on the basis of high, low and middle range values for specific gravity. In the low group are listed all values below 1.060, and in the high group are values above 1.074.

Table 3 indicates how the loss of 19.5 pounds of adipose tissue in one subject results in a change in specific gravity. The values for the weight in water have been corrected for a residual air volume of 1,200 cc. One notes that a decrease in abdominal girth is followed by an increase in specific gravity.

COMMENT

Difference in Thoracic and Abdominal Girth as an Index of Corpulence.—Although variation in individual values except for the most obese subjects is considerable, the group values in relation to specific gravity show a definite trend according to table 4. The lean subjects on inspection possess the greater circumferential difference between chest and abdomen in comparison with the corresponding difference in fat men.

Body Weight and Specific Gravity.—The relationship between body weight and specific gravity (table 4) is not absolute but relative in the sense that for any selected group of homogeneous persons the heaviest men tend to have specific gravity values in the low range of the scale. The rather uniform decrease in average weight in relation to specific gravity is to be regarded as coincidental. Lean men, for example, weighing 200 pounds will have high specific gravity values in contrast with the measurements on fat men of the same weight.

The average weight, for example, of thirty-eight men in the high specific gravity group (table 5) was 148.7 pounds. In a separate series of determinations on exceptional athletes, presented in the second paper, a similar high value for specific gravity was associated with an average weight of 200 pounds. These facts suggest a fundamental relationship between adiposity and specific gravity.

TABLE 3.—*Individual Loss of Weight in Relation to Specific Gravity*

		Weight				Circumference			
		In Air		In Water (Net)		Chest		Abdomen	
Date	Specific Gravity	Pounds	Kg.	Pounds	Kg.	Inches	Cm.	Inches	Cm.
3/12	1.056	202.5	92.0	10.8	4.9	38.5	97.8	35.2	89.4
7/1	1.060	194.5	88.4	11.0	5.0	.....	.....	.....	.....
8/15	1.066	187.0	85.0	11.6	5.3	38.7	98.3	33.0	83.8
10/9	1.071	183.0	83.2	12.1	5.5	39.1	99.3	31.4	79.7

On the assumption that a loss of 27.3 pounds of body weight in air is associated with a gain of weight in water of 1.7 pounds (11.1—9.4), the specific gravity of the low group following this loss of weight will be raised from an initial value of 1.056 to 1.081.

Thus, for every pound of weight lost the weight of the body in water is increased 0.062 pound (1.7 ÷ 27.3). The specific gravity of the reduced tissues is therefore 0.94 (1 ÷ 1.062), or a value in accord with the specific gravity of adipose tissue.

The average difference in thoracic and abdominal measurements of 5.8 and 3.7 inches for the high and low groups respectively suggests that excess adipose tissue accounts essentially for the difference in values for specific gravity of the two groups.

Individual Loss in Weight (table 3).—A man placed on a restricted diet and engaging in systematic exercise

lost 19.5 pounds over a period of seven months. The net weight in water increased from 10.8 pounds to 12.1 pounds, although the corresponding weight in air decreased from 202.5 pounds to 183.0 pounds. Thus, for every pound of weight lost in air the weight in water increased 0.067 pound (1.3 ÷ 19.5). The specific gravity of the reduced tissue is therefore 0.937 (1.000 ÷ 1.067), or a value again in accord with the specific gravity of neutral fat.

The reduction in abdominal girth further suggests that the eliminated tissue was chiefly fat.

Specific Gravity and Composition of the Body.—Of all the constituents of the tissues of the body, fat and bone appear to be the chief determinants of the ultimate values for specific gravity. In the comparison of the three groups (table 5) the difference between the average of the high and low values could best be attributed to a variation in adipose tissue. On the other hand, it is expected that the relative amount of bone may alter individual values within a limited range.

In table 6 hypothetic examples are presented to clarify the relationship between specific gravity and the composition of the body especially with respect to variation in the percentage of bone and fat.

For the purpose of our analysis the body may be viewed as comprising calcium salts representing 50 per cent of the weight of bone, essential or irreducible lipoid substance, excess adipose tissue, and all other tissues of the body embracing chiefly muscle, organs, brain, skin and blood.

The specific gravity of the mineral substance of bone is of the order of 3.0, adipose tissue 0.94, and all other tissue 1.060. This last figure is an approximation based on the specific gravity of blood and various other tissues according to Vierordt [4] and Nadeshdin.[5]

With reference to the specific gravity of blood, eighty-one determinations made according to the method of Barbour and Hamilton on eighteen of the ninety-nine subjects reported on in this paper gave an average in agreement with the data of Stern [1] of 1.060, standard deviation 0.002.

The percentage of skeletal weight in relation to the body as a whole exclusive of excess adipose tissue may not be expected to vary more than 4 units. Corresponding to this variation of 4 units in the percentage of body weight attributed to bone is a fluctuation of specific gravity of 13 units (table 6).

TABLE 4.—*Specific Gravity in Relation to Weight, Age, Height and Measurements of Thoracic and Abdominal Circumference*

Specific Gravity	Number of Men	Average Weight		Range, Pounds	Average Age	Average Height		Average Circumference				Average Difference, Inches	Difference, Range
								Chest		Abdomen			
		Pounds	Kg.			Inches	Cm.	Inches	Cm.	Inches	Cm.		
1.000-1.009	2	223	105.9	221-245	34	69.9	175.9	41.5	105.4	41.6	105.7	−0.1	−0.75-0.50
1.010-1.019	7	187	85.0	174-209	46	71.0	180.3	38.7	98.2	35.9	91.2	0.9	0.75-1.00
1.020-1.029	4	166	75.4	145-194	31	68.9	169.9	38.0	96.5	33.7	85.6	4.3	3.00-5.25
1.030-1.039	20	171	77.7	126-208	28	69.3	176.0	37.2	94.5	33.0	83.8	4.2	1.00-7.25
1.040-1.049	22	159	71.8	131-202	34	68.1	173.0	35.6	90.4	30.3	77.0	5.3	3.75-7.00
1.050-1.059	27	133	60.5	131-199	25	69.4	176.3	35.7	90.7	30.0	76.2	5.6	2.50-8.50
1.060-1.069	14	148	67.3	130-164	24	69.4	176.3	35.7	90.7	29.7	75.4	6.1	2.75-7.75
1.070-1.079	7	140	63.5	125-163	23	69.9	177.5	35.5	90.2	28.6	72.6	6.9	5.25-8.25

TABLE 5.—*High, Intermediate and Low Specific Gravity Group Values in Relation to Weight and Circumferential Measurements*

Number of Men	Average Specific Gravity	Range	Average Weight		Average Circumference				Difference, Inches	Average Height	
					Chest		Abdomen				
			Pounds	Kg.	Inches	Cm.	Inches	Cm.		Inches	Cm.
38	1.031	1.075-1.027	148.7	67.6	35.3	89.7	29.6	75.2	5.7	69.7	177.0
33	1.048	1.060-1.074	156.6	71.2	35.8	90.9	30.4	77.2	5.4	69.3	175.5
28	1.056	1.021-1.059	176.0	80.0	37.6	95.5	33.9	86.1	3.7	69.0	175.3

TABLE 6.—*Body Composition, Showing the Effect of Variations in the Percentage of Bone and of Fat on Specific Gravity*

	Percentage of Bone (10)				Percentage of Bone (14)			Variation in Fat Content		
	Specific Gravity	Percentage	Weight, Pounds	Volume	Percentage	Weight, Pounds	Volume	Percentage	Weight, Pounds	Volume
Bone salts *	3.0	5	10	3.3	7	14	4.66	5	7.0	2.3
Essential lipoids	0.94	10	20	21.2	10	20	21.20	10	14.0	14.9
Tissue	1.06	85	170	160.4	83	166	156.60	85	119.0	112.2
Totals			200	184.9		200	182.46	Lean man	140.0†	129.4
									60.0‡	53.5
								Fat man	200.0†	183.2
Specific gravity of the body as a whole		1.082				1.035			† 1.082; ‡ 1.035	

* $Ca_3(PO_4)_2$ and $Ca(CO_3)_2$, approximately one half the weight of marrow free bone.

‡ Excess adipose tissue.

In contrast with bone, the amount of excess fat is subject to wide variations and a value of 30 per cent of the total body weight is not unreasonable for obese persons. If a lean man weighing 140 pounds, for example, accumulates 60 pounds of adipose tissue, the corporeal specific gravity will be lowered from 1.082 to 1.035, representing a difference of 46 units.

Since the density of the mass of tissue exclusive of bone and fat is probably constant for healthy men, the amount of fat appears to be the main factor affecting the specific gravity of a person.

Our concepts with regard to the composition of the body can be summarized by the accompanying diagrams. *A*, for example, the volume of a lean body mass weigh-

4. Vierordt, H.: Anatomische, physiologische und physikalische Daten und Tabellen, 3d rev. ed., Jena, Gustav Fischer, 1906.

5. Nadeshdin, W. A.: Zur Untersuchung der Minderwertigkeit der Organe an Leichen, Deutsche Ztschr. f. d. ges. gerichtl. Med. **18**: 426-431, 1932.

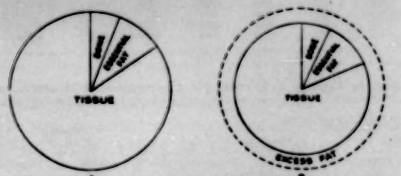
ing 200 pounds (90.9 Kg.), specific gravity 1.082, is divided into its components 1, 2 and 3.

In *B* the inner circle encompasses a mass similar to *A* in specific gravity and composition but differing in weight by 60 pounds (27.3 Kg.). The outer circle circumscribes an accumulation of 60 pounds (27.3 Kg.) of adipose tissue. The specific gravity of this 200 pound mass can be computed as 1.035, in contrast with the value of 1.082 for the mass represented by the inner circle.

The fundamental problem of the amount of variation of constituents 1 and 2 within the lean body mass remains to be determined. For the present the assumption is made that the percentage variation of these constituents based on body weight is small for lean men.

Excess fat therefore is viewed as the prime factor governing the level of specific gravity.

Precise measurements, however, of this excess fat will necessarily await a knowledge of the relative percentage variation of the weight of the skeleton in lean persons.



A represents the volume percentages of the three major specific gravity determinants of the body for a 200 pound, 90.9 Kg., lean man. The calculations were based on the following data: bone 10 per cent of body weight, specific gravity 1.60; essential fat 10 per cent, specific gravity 0.94; tissue 80 per cent, specific gravity 1.06. The volume percentages are therefore bone 6.8 per cent, essential fat 11.5 per cent, tissue volume 81.7 per cent. The specific gravity of this man would be 1.082. The solid inner circle in *B* represents the volume percentages for a 140 pound, 63.6 Kg., lean man. The volume percentages and specific gravity are the same as for the 200 pound (90.9 Kg.) lean man. The dotted outer circle represents the addition of 60 pounds of excess fat to the 140 pound lean man. The bone volume percentage is lowered to 4.3 per cent, the fat volume percentage is increased to 40.8 per cent and the tissue volume is reduced to 54.7 per cent in this man. Thus the specific gravity of the body is reduced to 1.035.

Of the anthropometric measurements, the chest diameters and height are expected to modify the values for specific gravity in persons possessing the same degree of obesity.

CONCLUSIONS

1. The fundamental biologic characteristic of corporeal density can be accurately measured usually within 0.004 unit by the method of hydrostatic weighing, provided a correction is made for the air in the lungs.

2. Values of specific gravity for healthy men ranging in age between 20 and 40 fall between 1.021 and 1.097.

3. Low values for specific gravity indicate obesity and, conversely, high values denote leanness.

4. Individual loss in weight through exercise and a restricted diet is associated with an increase in specific gravity.

5. Difference in the circumferential measurements of chest and abdomen serve as a criterion of obesity and can be correlated with specific gravity.

6. Variation in the percentage of bone in relation to body weight, excluding excess fat, is not expected to produce deviation of more than 0.013 units in comparable values.

THE SPECIFIC GRAVITY OF HEALTHY MEN

BODY WEIGHT ÷ VOLUME AND OTHER PHYSICAL CHARACTERISTICS OF EXCEPTIONAL ATHLETES AND OF NAVAL PERSONNEL

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In the preceding paper Behnke, Feen and Welham[1] have emphasized the value of the specific gravity of the body as a whole as an index of obesity. In their investigations a high value of 1.081 was associated with an average weight of 148.7 pounds (67.6 Kg.), while the corresponding weight for a group having an average low value of 1.056 was 176 pounds (80 Kg.).

If obesity and not weight per se is the chief factor tending to produce low values for specific gravity, then conversely a group of heavy but lean men should possess a high average value for specific gravity.

It was of considerable interest, therefore, to make a study of professional football players, the majority of whom had been selected for "all American" football teams. Essentially it was found that, although the average weight of these men was 200 pounds (90.9 Kg.), the average specific gravity reached the high value of 1.080. For comparison with these data and those recorded in the preceding paper, additional measurements were made on seventy-five naval men.

According to standard height-weight tables the majority of the football players could be classified as unfit for military service and as not qualified as risks for first class insurance by reason of overweight. The data presented in this paper therefore support the concept that specific gravity or weight of tissue per unit volume gives a true index of proper weight and not the standard tables which interpret weight in relation to height.

These findings together with accurate measurements of thoracic and abdominal circumferences and diameters provide information as to the physical characteristics associated with rugged physique and unusual fitness.

METHODS EMPLOYED

The technic used to measure specific gravity has been described in the preceding paper.[1] The body weight both in air and in water was accurately recorded to within 30 Gm. Measurements were made on the athletes following a morning "workout" and prior to eating. Similar data were recorded on naval personnel usually in the mid morning.

The chest diameters, anteroposterior and lateral, were taken with broad branched calipers at the level of the nipple line and recorded at the mean between inspiration and expiration in accordance with instructions from Dr. Aleš Hrdlička. For these measurements the subjects stood relaxed in the manner indicated in figure 2*A*, elbows held at an angle of 45 degrees from the body, and forearms and hands held in a position of dependent flexion.

The material in this article should be construed only as the personal opinion of the writers and not as representing the opinion of the Navy Department officially.

1. Behnke, A. R., Jr.; Feen, B. G., and Welham, W. C.: The Specific Gravity of Healthy Men, this issue, p. 495.

The body height was recorded with the subject standing erect, his back in contact with a vertical meter stick scale along which a wide sliding prong was used to touch the vertex of the head.

The circumference of the chest and of the abdomen was measured by means of a shellacked length of linen tape graduated in millimeters. For these measurements as 200 pounds (90.9 Kg.), height as 72 inches (182.9 cm.), age as 25 years, circumference of the chest as 40 inches (101.6 cm.) and of the abdomen as 33 inches (83.8 cm.). As the weight increases in this group, values for specific gravity tend to decrease.

In table 2 corresponding data are presented from measurements obtained on seventy-five men in the naval

TABLE 1.—*Professional Football Players: Specific Gravity in Relation to Weight, Age, Height and Measurements of Thoracic and Abdominal Circumference, Chest Diameter, Residual Air and Vital Capacity*

		Weight		Height				Circumference				Chest Diameter				
								Chest		Abdomen		A. P.		Lat.		
Subject	Specific Gravity	Lb.	Kg.	In.	Cm.	Age	Vital Capacity, Liters	In.	Cm.	In.	Cm.	In.	Cm.	In.	Cm.	Residual Air, Liters
1	1.097	181.0	82.3	72.1	183.1	22	5.650	37.5	94.8	30.4	77.3	9.5	24.2	12.3	31.3	1.362
2	1.095	185.7	84.4	69.0	175.3	22	6.400	39.1	99.4	31.2	79.3	9.3	23.6	12.2	31.0	1.402
3	1.095	194.7	88.5	72.0	183.0	24	6.050	39.2	99.7	30.7	78.0	9.4	23.8	12.4	31.4	1.360
4	1.094	183.3	83.3	69.2	175.8	24	4.625	38.5	97.9	32.0	81.2	9.2	23.2	12.9	32.9	1.415
5	1.094	190.3	86.5	72.0	182.8	23	6.500	40.2	102.2	30.2	76.7	10.0	25.3	13.1	33.2	1.569
6	1.094	170.2	77.4	69.2	175.7	27	5.600	38.4	97.4	31.2	79.3	8.5	21.5	12.1	30.8	1.438
7	1.091	192.0	87.3	72.7	184.8	24	6.010	39.8	101.0	32.0	81.2	10.0	25.4	12.3	31.2	1.570
8	1.091	183.5	83.4	73.1	185.7	24	6.000	40.1	102.0	30.5	77.5	9.0	23.0	13.9	35.3	1.797
9	1.088	188.2	85.5	72.6	184.4	28	5.320	38.4	97.6	31.4	79.9	9.1	23.2	12.5	31.3	1.339
10	1.088	189.3	86.1	72.3	183.7	31	6.000	38.8	98.5	30.8	78.2	9.2	23.4	12.6	32.1	1.341
11	1.086	200.7	90.5	72.6	184.5	22	6.300	41.3	105.0	34.9	88.8	9.6	24.4	13.7	34.9	1.900
12	1.083	187.7	85.3	73.5	187.6	24	5.310	37.7	95.8	33.0	83.9	9.6	24.5	11.8	30.0	1.321
13	1.084	179.6	81.7	70.5	1.9.2	25	5.570	39.1	99.4	31.5	80.0	9.2	23.5	13.0	33.0	1.468
14	1.081	220.4	100.2	75.0	190.4	21	6.000	39.4	100.0	33.0	83.9	11.4	29.0	12.4	31.4	1.383
15	1.080	180.9	82.3	68.7	174.4	24	5.700	40.5	102.8	31.5	80.0	10.1	25.7	14.0	35.6	1.520
16	1.080	198.2	90.2	73.2	185.9	25	5.550	40.1	101.8	32.1	81.5	9.5	24.2	13.6	34.5	1.506
17	1.080	200.4	91.1	74.7	189.8	27	6.000	40.9	104.0	34.8	88.5	11.4	29.0	12.5	31.2	1.360
18	1.078	194.4	88.4	69.1	175.6	25	5.000	39.9	101.4	33.3	84.7	10.3	26.2	12.2	31.0	1.197
19	1.071	194.3	88.3	72.1	183.1	29	5.400	40.5	102.9	33.6	85.3	9.6	24.3	13.2	33.9	1.784
20	1.066	217.1	98.7	72.4	183.9	25	5.020	40.1	102.0	36.4	92.5	10.1	25.7	13.2	33.5	1.429
21	1.064	210.6	95.7	72.6	184.5	27	4.500	40.1	101.8	34.7	88.1	10.3	26.2	12.7	32.1	1.386
22	1.064	250.5	117.9	75.3	191.2	25	7.250	45.9	116.5	38.9	98.8	12.1	30.7	13.2	33.6	1.605
23	1.060	217.2	98.7	74.0	188.0	29	4.000	40.9	104.0	34.0	86.3	9.8	24.8	13.4	34.0	1.298
24	1.051	223.0	101.4	73.0	185.5	25	5.940	41.6	105.6	36.0	91.5	10.1	25.6	13.5	34.2	1.440
25	1.051	251.2	114.2	71.8	182.5	27	4.980	44.5	113.0	38.5	97.9	12.3	31.3	14.5	36.9	1.569
Average	1.080	200.6	91.2	72.1	183.1	25.2	5.831	40.0	101.6	33.1	84.1	9.9	25.1	13.0	33.0	1.444

TABLE 2.—*Naval Personnel: Specific Gravity in Relation to Weight, Age, Height and Measurements of Thoracic and Abdominal Circumference, Chest Diameter, Residual Air and Vital Capacity*

		Average Weight				Average Height		Average Circumference					Chest Diameters			Average Residual			
								Chest		Abdomen		Difference,	Difference	A. P.		Lateral			
Specific Gravity	No. Men	Lb.	Kg.	Range, Lb.	Age	In.	Cm.	In.	Cm.	In.	Cm.	In.	Range, In.	In.	Cm.	In.	Cm.	Residual Air, Liters	Residual Air, Range	Average Vital Capacity, Liters
1.030-1.040	1	183.5	83.4	.....	30	71.0	180.3	37.8	96.0	33.0	83.8	4.8	.....	9.5	24.2	12.7	32.2	1.380	.....	4.910
1.040-1.045	1	159.8	72.6	.....	30	67.6	171.7	36.6	93.0	32.4	82.3	4.2	.....	9.3	23.6	12.2	31.0	1.047	.....	4.440
1.050-1.059	11	172.4	78.4	129-216	31	69.0	172.7	37.7	95.8	33.2	84.3	4.5	0.8- 8.3	9.7	24.6	12.4	31.5	1.375	1.200-1.567	5.415
1.060-1.069	18	165.2	75.1	123-180	30	68.4	173.7	36.3	92.2	31.0	78.7	5.3	2.7- 7.7	8.8	22.3	11.9	30.2	1.457	0.656-6.224	4.592
1.070-1.079	14	156.3	71.0	143-171	24	67.6	171.7	36.5	92.7	30.2	76.7	5.3	5.0- 7.4	8.8	22.3	12.0	30.5	1.496	1.080-2.004	4.903
1.080-1.089	16	156.3	71.0	132-197	25	69.0	175.2	36.5	92.7	30.0	75.9	6.5	3.5- 9.5	8.9	22.6	11.7	29.7	1.602	1.177-2.147	5.192
1.090-1.099	14	134.0	70.0	122-176	23	70.2	178.3	36.0	91.4	28.8	73.1	7.3	4.4-10.0	8.6	21.8	11.9	30.2	1.663	1.349-2.195	4.962

TABLE 3.—*High, Intermediate and Low Specific Gravity Group Values in Relation to Weight and Circumferential Measurements*

				Average Weight		Circumference					
						Chest		Abdomen		Difference,	Average Height
No. Men	Average Specific Gravity	Range		Lb.	Kg.	In.	Cm.	In.	Cm.	In.	In.	Cm.
Naval Personnel												
13	.....	1.051	1.035-1.057	172.3	78.6	37.6	95.5	33.1	84.1	4.5	68.2	173.2
24	.....	1.066	1.060-1.074	156.9	71.3	36.1	91.7	30.6	77.7	5.5	68.5	174.0
38	.....	1.086	1.075-1.096	156.9	71.3	36.5	92.7	29.7	75.4	6.8	69.4	176.3
Trained Athletes (Professional Football Players)												
25	.....	1.080	1.051-1.097	200.6	91.2	40.0	101.6	33.1	84.1	6.9	72.1	183.1

the subject stood erect and held his arms fully extended upward, the palmar areas of the hands in contact (fig. 2*B*). This maneuver reduced to a minimum the influence of the pectoral musculature and fat.

The residual volume of the lungs was determined on all subjects by the helium dilution method.[1]

RESULTS OBTAINED

In table 1 are listed the values obtained on the twenty-five exceptional athletes. The averages in whole numbers list specific gravity as 1.080, weight service, mainly in the age group of 20 to 35 years. A progressive increase in the difference between thoracic and abdominal girth is associated with an increase in specific gravity. The inverse relationship between weight and specific gravity is also apparent.

In table 3 the averages are given for naval personnel divided into three groups on the basis of high, middle and low values for specific gravity, i. e. above 1.074, 1.060 and 1.074 inclusive and below 1.060 respectively. For comparison, corresponding data are listed for the athletes.

The values for residual air showed the greatest range of variation in naval personnel compared with similar values for athletes. An average figure of 1,500 cc. for both groups is in close agreement with previous determinations.[1]

CHEST AND ABDOMINAL MEASUREMENTS

The difference in circumference between chest and abdomen of 6.9 inches (17.5 cm.) for the athlete and of 6.8 inches (17.3 cm.) for the lean naval man is

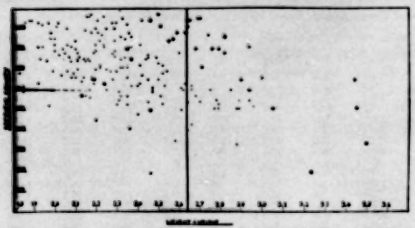

Fig. 1.—The specific gravity of each subject is plotted on the ordinate against the ratio of weight to height for that subject on the abscissas. The dotted points represent values for naval personnel, and the circled dots represent two subjects falling on the same point. The crosses represent values for the athletes studied. The vertical line at a weight to height ratio of 2.65 represents the upper limit of the ratio allowable in selection of men for military duty. For the age group represented by this series, those to the right of the vertical line are considered not qualified as good risks for first class insurance by reason of overweight.

in accord with the conclusions that these types of men possess minimal adipose tissue. For the group having a low specific gravity of 1.051 (table 3) the corresponding difference is 4.5 inches (11.4 cm.).

Although individual variation in the circumferential difference is large, the group values correlate closely with specific gravity. Since these measurements are easy to obtain, their difference may serve as a good index of relative obesity when groups of individuals are compared.

The mean of the thoracic diameters for the athletes is 1 inch (2.54 cm.) greater than the corresponding measurement for the naval group possessing a similar average value for specific gravity.

RESIDUAL AIR AND VITAL CAPACITY

A value of 1,450 cc.[1] can be used as a group average for residual air volume without appreciably altering the results.

The values for vital capacity in athletes are considerably higher than the corresponding value obtained on naval personnel. Apparently there is no relationship between specific gravity and vital capacity.

COMMENT

The data obtained on seventy-five naval men in the present investigation are in accord with the previous measurements obtained on a similar group of ninety-nine men [1] as shown in the tabular summaries.

Weight in Relation to Specific Gravity.—With reference to the group of athletes it is observed that an average weight of 200 pounds (90.9 Kg.) is associated with a high value for specific gravity of 1.080, and that in even six of the heaviest men of the group, average weight 230 pounds (104.5 Kg.), the average value for specific gravity was 1.059. This fact supports the concept that adipose tissue and not weight per se is the governing factor determining specific gravity.

Among naval personnel [1] an average value for specific gravity of 1.081, and in the group listed in table 3 of 1.086, was associated with weights of 149 and 157 pounds respectively. The chief physical difference between the exceptional athlete and naval personnel possessing similar tissue densities is approximately 50 pounds (22.7 Kg.) of body mass.

Stature.—Associated with the increase of weight is a taller stature of 2 to 3 inches for the athlete compared with the man in the military service. Whether or not this characteristic means that skeletal size in relation to body mass is an important factor that enables the athlete to maintain a high corporeal density despite the increased weight cannot be determined from the anthropometric data.

Specific Gravity in Relation to Height-Weight Tables.—The criterion as to the proper weight of an individual is based on a relationship between stature and absolute body weight, modified by age. Numerous sturdy persons, however, exceed by 15 per cent the weight values recorded as average for a given height. Rejections for military service, for example, on the basis of overweight might serve to eliminate outstanding athletes.

A more valid basis than standard height-weight tables for an estimate whether or not an individual is obese is not absolute weight but rather specific weight; that is, weight in relation to unit volume of tissue.

The plotted data (fig. 1) show the relationship between specific gravity and weight per unit of height. If an arbitrary value for specific gravity of 1.060 is taken as the dividing line separating qualified men from those not qualified because of excessive fat, two of the twenty-five athletes would be eliminated.

On the basis of the standard height-weight tables used by insurance companies and in the military service, seventeen of the twenty-five athletes could be considered as not physically qualified for military duty or first class insurance risk, if an allowance of 15 per cent above the average values in the tables is considered as the upper limit.

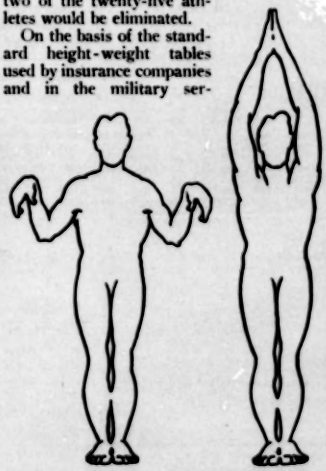

Fig. 2.—*A*, represents the position assumed by the subject for measurements of anteroposterior and lateral chest diameter. The measurements were taken at the level of the nipple line as described in the text. *B*, represents the position assumed for measurements of the circumference of the chest and abdomen. The latter measurements were taken at the level of the umbilicus.

Of the seventeen rejected "all-American" football players, eleven fall into the group possessing high corporeal specific gravity. According to our classification these eleven men are in prime physical condition if the absence of excessive fat is a criterion of fitness. The type of physical exertion, moreover, that these men are called on to make is proof of their sturdy physique, estimated in terms of speed, agility and endurance.

We propose, therefore, the classification of men as overweight on the basis of specific gravity of the body mass, using a tentative dividing line of 1.060 for the elimination of the obese.

This division, following a line parallel to the abscissas (fig. 1), is diametrically opposed to a division based on height-weight tables, which follow a line at right angles to the abscissas (fig. 1).

THE SURGICAL APPROACH TO HYPERTENSION

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Hypertension is a common symptom of several fundamentally different disorders. Its medical treatment in the past has consisted of rest, the use of sedatives, vasodilators and toxic depressants and psychoanalytic sessions.[1] It can be safely stated that none of these measures have ever cured or arrested the progress of hypertension, although their temporary, palliative value, especially in the early stages, cannot be questioned. Recently a depressor substance has been isolated from the normal kidney and used in lowering the blood pressure of animals and of man.[2] It is too early to judge the merits of this extract in combating hypertension. The fact remains that cardiovascular-renal disease, with hypertension as its dominant symptom, stands first in the mortality list today and is responsible for more than half a million deaths annually in the United States. After the age of 45 the death rate from this condition is four times that from cancer and twenty times that from either tuberculosis or diabetes[3] (fig. 1).

With the recognition of entities such as tumor of the chromaffin system[4] and unilateral renal disease producing hypertension,[5] certain surgical indications have been crystallized and have received general acceptance. There remains, however, the overwhelming majority of hypertensive patients about whose classification and treatment there is much disagreement. The early surgical efforts of Italian surgeons, followed in this country by the pioneer work of Adson, Peet, Heuer and other investigators, have given a great impetus to progress in the surgical therapy of hypertension.[6] With increasing experience and frequent exchange of ideas, certain fundamental questions regarding selection of cases and operative technic have become standardized in several clinics. It is our purpose here to describe our classification, preoperative study, indications and technic and the early and late results.

A group study of hypertensive patients is essential, uniting ophthalmologist, pathologist, urologist, internist and surgeon for the common purpose of determining the optimal course of management. Such a cooperative effort, in which all participants speak the same language and in which no group tries to dominate the other or rationalize the other's undertakings, saves many a patient from useless operations and results in an unbiased follow-up study of surgical results.

PATIENTS STUDIED

The number of patients treated is small but the study covers the period from 1932 to 1940, with no patient included who was treated after December 1940, so that the minimal period of follow-up study is six months (table 1). It is obvious that with increasing experience, with the use of routine pyelograms and, if necessary, differential tests of renal function the diagnosis of so-called essential hypertension will yield to a more specific one. Thus, all the patients with this diagnosis were thought primarily to have nonrenal, essential hypertension with no or insignificant urinary abnormalities. The history, the renal biopsy specimens taken at operation and the postoperative course led to a recognition of the true nature of the disease. Atrophic pyelonephritis,[5] lupus kidney,[7] congenital hypoplastic kidney[8] and adrenal medullary tumor[4] are becoming recognized causes of chronic diastolic hypertension. We are impressed with the frequency with which toxemia of pregnancy and pyelonephritis of pregnancy also figure in the history of hypertensive women.[9] The pituitary origin of some hypertension is still debatable.[10] The emphasis on renal disease in essential hypertension in human beings does not mean, however, that the con-

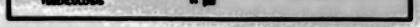

Fig. 1.—Mortality statistics taken from the data of the Metropolitan Life Insurance Company (from Dublin, L. I., and Lotka, A. J.: Twenty-Five Years of Health Progress, New York, Metropolitan Life Insurance Company, 1937).

From the Departments of Surgery and Medicine, University of Illinois College of Medicine.

Each of the references cited in this article was chosen for containing an up-to-date review of its subject.

Because of lack of space, a report of illustrative cases has been omitted. The complete article will appear in the authors' reprints.

Read before the Section on Surgery, General and Abdominal at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 3, 1941.

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stitutional, hereditary factors and the neurogenic and endocrine types of hypertension do not play an important part. We have used a modification of Schroeder and Steele's [11] classification for a working basis (table 2). This classification well represents our present state of knowledge. In an attempt to assign to these various factors a proper relationship, Edward Weiss [1] has constructed a diagram which illustrates them (fig. 2). This diagram simply means that the presence in a person of one factor, such as renal ischemia following eclampsia, with a noncontributory family history and no constitutional factors, may not lead to hypertension, whereas in another person a small emotional, environmental or toxic stress may bring on hypertension because of the inherent vascular reactivity of the patient or because of his glandular makeup.

TABLE 1.—*Data on Surgically Treated Patients with Hypertension (June 1, 1940)*

Diagnosis	Number of Patients
Atrophic pyelonephritis	2
Lupus kidney	1
Congenital hypoplastic kidney	3
Eclamptic kidney	3
Adrenal medullary tumor	2
Benign nephrosclerosis	25
Malignant nephrosclerosis	8
Total	44

THE PREOPERATIVE STUDY

The purpose of preoperative study was (1) to establish criteria for the selection of patients for operation and (2) to provide a yardstick with which the benefit derived from the operation could be measured objectively. The data were summarized on one chart and the examinations repeated every two to three months after the operation (table 3). On the basis of these studies it was possible to grade most patients readily into one of the four groups of Wagener and Keith.[12] A similar grouping has been adopted by Palmer and his associates [13] at the Massachusetts General Hospital (table 4). Most patients fall into one of these groups; a given patient may have severely progressive hypertension and pass from group 1 to group 4; in other patients the disease may be stationary for many years.

TABLE 2.—*Classification of Arterial Hypertension* *

Clinical Lesions			
Renal			
A. Parenchymal	B. Vascular	Nervous	Endocrine
Glomerulonephritis	Arteriosclerosis	Brain tumor giving rise to increased intracranial pressure	Pituitary basophilism
Pyelonephritis	Buerger's disease		
Urinary obstruction	Periarteritis nodosa	Disease of the brain stem (bulbar poliomyelitis)	Adrenal tumor (of medulla and cortex)
Renal tumor	Renal infarct		Hyperthyroidism
Amyloid kidney	Lupus erythematosus	Psychic disturbance	Ovarian tumor
Polycystic kidney	Lead poisoning		Menopause
Hypoplastic kidney	Coarctation of the aorta		Obesity
Eclamptic kidney			

* Modified from Schroeder and Steele.[11]

SELECTION OF PATIENTS FOR OPERATION (TABLE 3)

From the study of reports in the literature and our own results, we feel that patients with grade 4 hypertension (malignant nephrosclerosis) are not benefited by any of our operative procedures. True enough, for these patients, who are often young and hopelessly lost, any attempt which carries a low surgical mortality is justifiable. Our records of 8 such patients would indicate that despite subjective improvement lasting for a variable period no objective relief has been gained. Interestingly enough, the renal extract of Page [6] gave subjective and objective relief for similar patients as long as the substance was administered. When the material becomes available there may be something that can be done for such patients. In groups 2 and 3 patients are greatly improved if complete splanchnic nerve section is performed, whereas in group 1 complete cures have been observed. Caution is necessary to prevent confusing the early hypertension of young persons in group 1 with arteriosclerotic hypertension of patients in the fifties. The latter have a high pulse pressure and may have a high systolic pressure, but their diastolic pressure is frequently around 100 mm. of mercury. This frequently occurring type of hypertension, due to an atheromatous aorta, is not within the scope of our discussion.

Fig. 2.—Pathogenesis of hypertension (redrawn from Weiss.[1]). The base of the pyramid is made up of constitutional and hereditary factors.

SURGICAL PROCEDURES

Besides the stage of the disease in which the operation is undertaken, the technical procedure is an important factor in the results obtained. In our clinic the following procedures have been used:

1. *Supradiaphragmatic Splanchnic Nerve Section.*—In this operation one interrupts the splanchnic nerves above the diaphragm and excises the ninth to the twelfth sympathetic ganglions. The operation was originally described by Pieri [14] and was performed in 1932 by one of us [15] to increase the insulin sensitivity of a patient with juvenile diabetes and was popularized by Peet.[16] The operation does not permit the examination of the kidney and the adrenal gland and cannot interrupt the lumbar sympathetic nerves, whose part in the mechanism of postoperative relief will be discussed.

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2. Infradiaphragmatic Splanchnic Nerve Section.—The splanchnic nerves are severed below the diaphragm, together with a small slice of the celiac plexus. In addition, the first and second lumbar ganglions are removed. The procedure described by Pereira [17] has been modified by Craig.[18] We have used Flothow's [19] muscle-splitting anterolateral approach to the lumbar sympathetic nerve.

3. Transdiaphragmatic Splanchnic Nerve Section.—This operation combines the advantages and eliminates the disadvantages of the two previous operations. It is a complete resection of the major splanchnic nerve, removing it from the fifth dorsal root down to its entrance into the celiac ganglion. In addition the sympathetic ganglionated trunk is removed from the ninth dorsal to below the first or occasionally the second lumbar ganglion. In order to obtain this exposure, the diaphragm must be incised and sutured. Through this approach, the renal artery, pelvis, ureter, renal paren-

TABLE 3.—*Sample Form for Preoperative Study of Hypertensive Patients*

Name: E. L. **Age:** 26 **Sex:** Male **Race:** White

Present complaint: High blood pressure for 3 weeks (found during physical examination); no symptoms

History: No history of nephritis, facial or ankle edema or hematuria; scarlet fever 1931; no familial incidence of hypertension

Vascular Reactivity

12 hour blood pressures (during bed rest):

7 a. m. 180/134	1 p. m. 180/124
8 a. m. 170/122	2 p. m. 178/120
9 a. m. 160/120	3 p. m. 160/110
10 a. m. 184/118	4 p. m. 160/120
11 a. m. 170/120	5 p. m. 160/122
12 Noon 170/112	6 p. m. 160/120
	7 p. m. 160/118

Sodium amytal (oral dose), 0.6 Gm. (bed rest):
Lowest blood pressure before, 178/124
Lowest blood pressure after, 130/98

Pentothal sodium (intravenous dose) 2 Gm.:
Lowest blood pressure before, 175/120
Lowest blood pressure after, 138/90

Sodium nitrite (oral) dose ½ grain (0.03 Gm.) hourly for 6 doses:
Lowest blood pressure before, 226/155
Lowest blood pressure after, 180/118

Cold stimulus (method of Hines):
Lowest blood pressure before, 180/118
Highest blood pressure after, 208/132
Systolic elevation, 28 mm.
Diastolic elevation, 14 mm.
Time to return 4 minutes

Renal Function

Urea clearance, 45.7 cc. per minute
Phenolsulfonphthalein return (15 minutes), 30 per cent

Concentration test (Lashmet-Newburgh):

	Specific Gravity	Volume
Specimen 1	1.029	600 cc.
Specimen 2	1.031	50 cc.
Specimen 3	1.031	20 cc.

Glomerular filtration rate, 129.4 cc. per minute

Total renal blood flow, 670 cc. per minute

Urinary content of albumin, 0 mg. per 100 cc.

Microscopic study of urine:
Casts per high power field, 0
Red blood cells per high power field, 0
White blood cells per high power field, 0

Heart size:
Cardiothoracic index, 0.5

Electrocardiogram:
(1) Sinus arrhythmia
(2) Small Q_3 and Q_4 present
(3) T_1 low, flat
(4) T_2 low, diaphasic
(5) P_2 high, sharp

Fundoscopic Examination:
Photographs of the fundi taken 10/15/40; there is some spasm of retinal arterioles, with slight sclerosis but no exudate or papilledema

Spinal Fluid Pressure, — mm.

Pyelogram, normal:

Comment: Hypertensive cardiovascular renal disease of Grade 2; good renal function and good fall in blood pressure with sedation

TABLE 4.—*The Grading of Essential Hypertension* *

	Early or Mild, Grade 1	Moderate, Grade 2	Late Benign, Grade 3	Malignant, Grade 4
Age	30 to 65	21 to 55	22 to 57	8 to 58
Symptoms	Early morning headaches, vertigo or no symptoms	No symptoms or early morning headaches, vertigo	Nervousness, headache, vertigo, nyeturia, dyspnea on exertion	Nervousness, visual disturbance, severe headaches, muscle pains
Retinal changes	Minimal narrowing of arterioles or no changes	Arteriovenous compression, moderate sclerosis of arterioles	Recurrent angiospasm, arteriolar sclerosis; hemorrhages, exudates; no papilledema	As in grade 3; plus papilledema
Blood pressure	Systolic pressure 200 to 150; diastolic 120 to 100; occasionally normal at rest	Systolic 250 to 170; diastolic 130 to 100; lower at rest but never normal	Almost always over 170/110; fluctuates upward	Diastolic very high; fixed blood pressure
Heart	Minimal if any changes	Slight enlargement, left ventricular preponderance, good function	Enlarged; actual or impending congestive failure; sometimes angina	Congestive or anginal failure often present
Urine	Normal	No change or mild albuminuria and casts	Contains albumin, casts, often red cells	Albumin, casts, red cells
Renal function	All tests show normal function; urea clearance may be slightly decreased	Slight decrease; urea clearance 50 to 40 cc.	Impaired function; urea clearance 20 to 30 cc.	Poor function; urea clearance 7 to 20 cc.
Brain	.....	.....	Cerebral accidents occur	Cerebral accidents
Five year mortality, percentage	30	46	80	99

* Our data combined with those of Wagener and Keith and Palmer and Smithwick.

Regeneration of the splanchnic nerves, which was described in animals by Cuthbert and de Takats,[13] is difficult to prevent after this operation. In obese patients or in those who have a retroperitoneal lymphadenopathy, the identification of all the splanchnic trunks may be difficult. Finally, branches that are given off toward the periaortic plexus from the splanchnic nerves and the sympathetic chain above the diaphragm are missed by this operation.

17. Pereira, A. de S.: Nervi splanchnici; contribuição para o estudo de anatomia e cirurgia dos nervos esplanchnicos, Porto, Portugal, Tipografia Porto Medico, 1929.

18. Craig, W. M.: Surgical Approach to and Resection of the Splanchnic Nerves for Relief of Hypertension and Abdominal Pain, West. J. Surg. **42**: 146, 1934.

19. Flothow, P. G.: Anterior Extraperitoneal Approach to the Lumbar Sympathetic Nerves, Am. J. Surg. **29**: 23, 1935.

chyma and adrenal glands may be inspected and palpated. The operation has been described by Reginald Smithwick.[20]

4. *Omental or Muscular Graft into the Kidney.*—After decapsulation and scarification of the kidney a 1 inch (2.5 cm.), deep incision is made along the whole convexity of the kidney and an omental flap or a pedicled muscle flap is sutured into the incision. The operation was first done in our clinic in 1936, and 5 cases were reported last year.[21] Nine cases were reported by Bruger and Carter.[22]

TABLE 5.—*Contraindications to the Surgical Treatment of Hypertension*

Grade 4 hypertension
Cardiac decompensation
Nitrogenous retention
Severe atheromatosis of larger vessels
Age over 50

5. *Nephrectomy.*—This is done for unilateral renal disease associated with hypertension when there is no detectable impairment of function in the opposite kidney. One patient was available for study in the group.

6. *Renal Biopsy.*—A small slice (1.5 cm. long and 3 mm. thick) of renal cortex was removed during the transdiaphragmatic and infradiaphragmatic sympathectomies and during the renal grafts. A total of fifteen biopsies were performed, and their value will be discussed hereafter.

RESULTS

Thirty [22a] patients have adequate follow-up records, by which it is meant that they were reexamined by one or several of us at intervals of two to three months. There were 4 patients with supradiaphragmatic, 15 with infradiaphragmatic and 5 with transdiaphragmatic splanchnic nerve section. Five had an omental or muscular graft and 1 nephrectomy for hypertension. There was no surgical mortality. We believe that at least two readily recognizable factors influence results (table 6). One is the type of operation performed and the other the stage of the disease in which the operation is undertaken. Of the splanchnic nerve sections the supradiaphragmatic and the infradiaphragmatic operation yielded such doubtful results that they were discontinued. The transdiaphragmatic, total splanchnic nerve section has given us excellent results in patients with grade 1 and grade 2 hypertension and produced considerable subjective relief in 1 patient with grade 3 hypertension. In 1 patient with malignant nephrosclerosis it failed. Of the 5 patients with grade 4 hypertension in whom a renal graft has been undertaken, only 1, who has now been followed for five years, has had subjective relief. One patient who had nephrectomy for unilateral atrophic pyelonephritis and 1 who had nephrectomy for congenital hypoplastic kidney had complete subjective and objective relief up to the time of this writing.

TABLE 6.—*The Surgical Approach to Hypertension as Influenced by Technic and by the Stage of Disease*

Types of operation	Grades of Hypertension 1	2	3	4	Total	Average Duration of Follow-Up Study, Months
Supradiaphragmatic	±—*	—	..	—	4	28
Infradiaphragmatic	±±	±— — — — —	— — — —	— —	15	56
Transdiaphragmatic	++	++	±	—	6	9
Renal graft	..	..	..	±— —	5	34
Nephrectomy	..	++	..	— —	2	9
Total	6	11	6	9	32	27

* +, good result: The blood pressure returned to normal or became stabilized at a much lower level. ±, little objective but considerable subjective improvement: The patient's symptoms were relieved. —, no result.

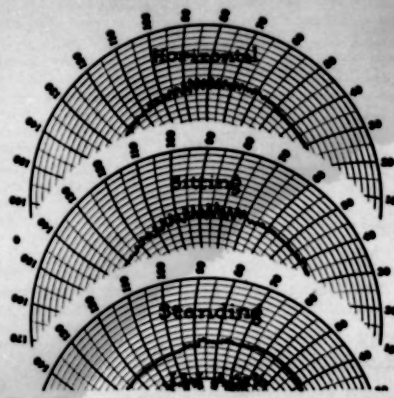

Fig. 3.—Postural hypotension three months after extensive splanchnic nerve section and lumbar sympathectomy. The pulse volume was small in the standing position; the blood pressure had dropped from 120 systolic and 75 diastolic to 95 systolic and 70 diastolic. For six weeks after the operation the blood pressure could not be obtained after the patient had stood five minutes.

COMMENT

If one looks on diastolic hypertension as a malignant process progressing with a varied speed but with unpredictable periods of acceleration, an analogy with the surgical treatment of carcinoma readily presents itself. Just as in the case of cancer, methods may well be developed which would make surgical intervention unnecessary; the joint efforts of Tinsley Harrison and Irvine Page may do the same for the surgical treatment of hypertension.[6] It is our feeling at present, however, that if the not too advanced ischemia of the kidney can be remedied by sympathectomy or vascular grafts the formation of the yet poorly understood pressor substances will be inhibited, so that substitution therapy with renal extracts will not be needed. That a gradual improvement of renal circulation occurs after splanchnic nerve section can be demonstrated by the slow fall in blood pressure and the improvement of urea clearance over a period of six to ten weeks which one observes in

20. Smithwick, R. H.: A Technique for Splanchnic Resection for Hypertension, Surgery **7**:1, 1940.

21. De Takats, Geza, and Scupham, G. W.: Revascularization of the Ischemic Kidney, Arch. Surg. **41**:1294 (Dec.) 1940.

22. Bruger, M., and Carter, R. F.: Nephro-Omentopexy and Nephromyopexy in the Treatment of Arterial Hypertension, Ann. Surg. **113**: 381, 1941.

22a. Since this paper was written an additional 10 patients have had a transdiaphragmatic splanchnic nerve section. With the exception of 2 patients in whom the operation was incomplete, the response to this procedure was equally satisfactory.

patients with grade 2 or grade 3 hypertension. In the earlier stages a relaxation of the spastic efferent arterioles could be demonstrated, as shown in a report by Grimson, Alving and Adams [22] and in some unpublished data from our institution, by means of the diodrast-inulin clearances.

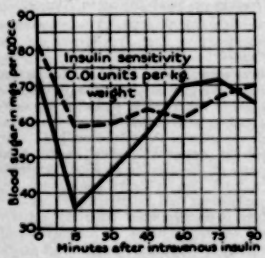

Fig. 4.—Increase in sensitivity to insulin following transdiaphragmatic splanchnic nerve section in R. L., a man aged 24 with grade 1 hypertension. Interrupted line, blood sugar curve before operation, and straight line, blood sugar curve six weeks after operation. The fall in blood sugar caused by insulin cannot release sufficient epinephrine to restore the blood sugar level as fast as could be done before the operation.

There is, however, another important effect of extensive splanchnic nerve section, namely postural hypotension. This occurs independently of the stage of the disease and is maintained, if the two upper lumbar ganglions are removed on each side, in its extreme for four to six weeks but does not disappear for as long as ten months after operation [20] (fig. 3). If patients avoid motionless standing for three to five minutes, they are unaware of this faulty adaptation to posture. It means that splanchnic vasoconstriction, which occurs normally on the assumption of the erect posture, is effectively interrupted. Effective circulating blood volume and the stroke volume of the heart are also reduced in the upright position. The patient then carries during the day and also during the night if he sleeps with the upper part of the body elevated [24] a lower pressure and thus relieves the blood vessels of the brain, heart, kidneys and extremities from excess strain.

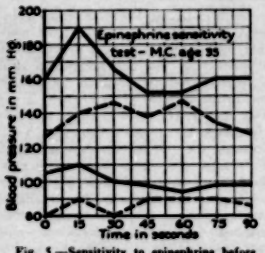

Fig. 5.—Sensitivity to epinephrine before and after splanchnic nerve section. Solid lines, before operation; interrupted lines, after operation.

There is also a considerable symptomatic relief from headaches, dizziness and palpitation in some patients who show no reduction in the level of blood pressure. There has been a tendency to assume a nonspecific action of the operation, possibly a psychologic influence.[25] Experimental evidence by Heinbecker [26] indicates that the substance produced by renal ischemia increases the sensitivity of smooth muscle to epinephrine. Cuthbert and de Takats showed in 1933 that adrenal denervation diminishes the sensitivity of the animal to epinephrine. It would seem that the relief from "nervous" symptoms, from the "inner tension" which all surgeons have observed after splanchnic nerve section, whether done for hypertension or diabetes, may well be considered due to adrenal denervation. Thus the emergency outpour of epinephrine, which is initiated by a fall in the blood sugar content, is inhibited by splanchnic nerve section (fig. 4); furthermore, the patient's sensitivity to epinephrine is decreased after the operation (fig. 5).

The different mechanisms which may bring about relief in hypertensive patients after splanchnic nerve section are listed in table 7.

The renal graft requires some discussion.[21] It is difficult to see how closed or narrowed terminal arterioles of the kidney or how hyalinized glomeruli could be reopened and made to function by a vascular implant. But some observations suggest that this operation deserves a trial even on theoretic grounds. First, it could be shown that the grafted vascular supply is capable of reaching the tubules and improving their circulation.[27] Second, it has been well demonstrated by the work of Oliver [28] that glomerular function can be at least partially compensated for by hypertrophy and hyperplasia of the primary convoluted tubules; furthermore, the glomerular blood supply can be sidetracked by arteries going directly to the tubules. Finally, the

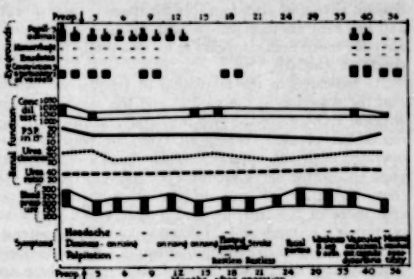

Fig. 6.—Effect of revascularization of the ischemic kidney. This is a five year follow-up record of A. J., who belonged to group 4 at the time of operation. She does not have papilledema after five years, and tests of the renal function show it to be essentially unchanged except for the concentrating ability. She has residual spasticity from the several cerebral accidents but no subjective symptoms. The blood pressure (average of twelve hourly determinations) is somewhat lower than before operation. Generally speaking, the malignant nephrosclerosis has been arrested.

TABLE 7.—*Mechanism of Relief in Hypertensive Patients After Extensive Splanchnic Nerve Section*

Actual lowering of blood pressure (diminution in size of heart and improvement in electrocardiogram)
Pronounced polyuria, diminished excretion of protein and improvement in renal function (immediate or gradual)
Postural hypotension with consecutive decrease in venous pressure and effective circulating blood volume; decrease in papilledema and improvement in cerebral circulation
Decrease in reflex nervous irritability due to adrenal denervation
Sensitivity to epinephrine diminished; sensitivity to insulin increased
Palpitation of heart and dizziness disappear even if basal blood pressure in horizontal position is unchanged

23. Grimson, K. S.; Alving, A. S., and Adams, W.: Experimental and Clinical Basis for Total, Bilateral Paravertebral Sympathectomy in Essential Hypertension, read before the meeting of the Central Society for Clinical Research, Chicago, November 1940.
24. MacLean, A. R., and Allen, E. V.: Orthostatic Hypotension and Orthostatic Tachycardia: Treatment with the "Head-up" Bed, J. A. M. A. 115: 2163 (Dec. 21) 1940.
25. Volini, I. F., and Flaxman, N.: The Effect of Nonspecific Operations on Essential Hypertension, J. A. M. A. 112: 2126 (May 27) 1939.
26. Heinbecher, P.: A Role for Surgeons in the Problem of Essential Hypertension, Ann. Surg. 112: 1101, 1940.
27. Weeks, D. M.; Steiner, A.; Mansfield, J. S., and Victor, J.: The Depressor Effect of Reno-Venopexy on Hypertension Due to Renal Ischemia, J. Exper. Med. 72: 345, 1940.
28. Oliver, J.: The Architecture of the Kidney in Chronic Bright's Disease, New York, Paul B. Hoeber, Inc., 1939.

postmortem records of Blackman [29] should be cited. He frequently observed atheromatous plaques at the origin of the renal artery in the kidneys of patients with essential hypertension. Such kidneys have a relatively intact terminal vascular bed and could be vascularized with more ease than a kidney with arteriolar sclerosis.

The exact indications for the vascular graft are not yet clear. It is our feeling that in cases of late atrophic pyelonephritis or of grade 3 essential hypertension, when splanchnic nerve section alone cannot bring about adequate revascularization of the kidney, this operation might be added to insure a maximal blood supply. The combined operation has kept a child of 8 with congenital hypoplasia of both kidneys and grade 4 hypertension alive and symptom free for more than two years and has kept another patient with grade 4 hypertension alive for more than six years in an essentially unchanged condition (fig. 6).

As indicated in the tabulation of results, we believe that the selection of the patient and the selection of the surgical technic are the two important factors in bringing about results. When all types of patients were operated on by an approach which did not permit complete splanchnic nerve section (Rytand and Holman [30]), there was a 20 per cent surgical mortality and 27 per cent more of the patients died a year and a half after operation. Rytand and Holman's courageous attempt serves to reemphasize the limitations of surgical therapy. The work of Keith and Smithwick in establishing the grades of hypertension and the best technical procedure has been coordinated in this study to bring about optimal results. At present, at least, the total sympathectomy practiced by Grimson, Alving and Adams [23] seems unnecessarily radical but may become the operation of choice if the present operation will not maintain its efficiency in the five year follow-up records.

SUMMARY

1. Thirty patients with essential hypertension (benign and malignant nephrosclerosis) were subjected to operative procedures.

2. The hypertensive state was classified as early, moderate, marked and malignant, after the classification of Keith and his associates. It was noted that malignant hypertension is a contraindication to operation.

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4. No method has come to our attention so far which would check the progress of hypertension more effectively than surgical therapy. The selection of patients with early hypertension and the use of an improved technic seem to be two important factors in obtaining good results.

5. Outside the actual lowering of blood pressure, the gradual improvement of renal function, the postural hypotension and the decrease in reflex nervous irritability due to adrenal denervation constitute the mechanisms of the relief obtained.

122 South Michigan Avenue—8 South Michigan Avenue.

29. Blackman, S. S., Jr.: Arteriosclerosis and Partial Obstruction of the Main Renal Arteries in Association with "Essential" Hypertension in Man, Bull. Johns Hopkins Hosp. 65:353, 1939.

30. Rytand, D. A., and Holman, E.: Arterial Hypertension and Section of the Splanchnic Nerves, Arch. Int. Med. 67:1 (Jan.) 1941.

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DR. REGINALD H. SMITHWICK, Boston: Dr. de Takats and his collaborators have raised the question Does complete denervation of the splanchnic bed of hypertensive patients offer more in the way of persistent and significant lowering of blood pressure than does partial denervation of the splanchnic bed? The splanchnic bed is completely denervated when shortly after operation the blood pressure in the standing position completely disappears or falls to a level that is incompatible with this upright position. The splanchnic bed is partially denervated when after operation there is no significant difference between the blood pressure in the standing position as contrasted with the horizontal position. Sixty-six unselected patients had partial denervation of the splanchnic bed. There was a fairly equal representation in each stage of the disease. Significant and persistent lowering of blood pressure was obtained in 9.1 per cent of these patients. A series of 38 patients had had complete or near complete splanchnic denervation, as judged by significant fall in blood pressure in the upright position after operation. Seventy-one per cent of these have had significant and persistent lowering of the blood pressure during the period of observation. The majority of the good results or the highest percentage were in groups 1 and 2, 87 per cent. However, a very significant effect (60 per cent) has been noticed in group 3 and particularly in group 4 cases. The results in the latter group do not allow me to agree with Dr. de Takats' statement regarding malignant hypertension. I do not believe that malignant hypertension is necessarily a contraindication to surgery. My impression from this rather preliminary surgery of a very small group of patients followed for six months to two and a half years after operation is that radical denervation of the splanchnic bed has more to offer patients with hypertension than partial denervation of the splanchnic bed.

DR. CLAUDE BECK, Cleveland: Dr. de Takats deserves admiration for his well directed efforts to explore further the function of the autonomic nervous system in human hypertension. To the question as to whether or not our present surgical procedures for essential hypertension are curative the answer must be "No." However, to the question as to whether or not in properly selected cases they effect results which are sufficiently palliative to be justifiable the answer is definitely "Yes." They are not curative because they do not remove the cause. The primary seat of the disease process in cases of essential hypertension is in the blood vessel walls themselves, particularly the blood vessels of the kidney. Nowhere more than in Cleveland can it be stressed that substances derived from the kidney can modify blood pressure and the circulation. Evidence seems to indicate that there are persons who are prone to develop hypertension because of the intrinsic properties of their blood vessels. Persons most likely to develop hypertension are born with a vascular tree hyperdynamic in its response to physical, nervous and humoral influences. Denervation of the renal vessels could be expected only to check or ameliorate a process which is primary in the vessels walls themselves and capable of progression without nervous influences. That the nervous system may play a significant role in the initiation and development of human hypertension is admitted by all. In man the nervous system is probably mostly concerned in the initiation of the hypertensive state. Consequently the plea is made again that persons giving adequate evidence that they probably will develop a fixed hypertensive state should be urged to have their kidneys and adrenals denervated. The surgeon's degree of success with such cases will vary directly with the timeliness of surgical intervention. The operation for essential hypertension as generally performed results in denervation of the adrenals as well as of

the kidneys. This must result in a diminution of the amount of epinephrine released especially during stress. Experimental evidence is at hand to show that the smooth muscles of hypertensive animals respond hyperdynamically to epinephrine, and it is possible to show that epinephrine can stimulate the central nervous system directly. The symptoms from which relief is secured are "nervous" in origin. On a perfectly reasonable basis denervation of the adrenals thus could be expected to lessen the nervous response to both centrally and peripherally directed nerve impulses. This is offered as an explanation for clinical improvement from nervous symptoms in patients in whom no blood pressure drop is secured. I would voice some skepticism about the necessity of extending the scope of our surgical procedures more and more, especially when early cases are available for treatment.

DR. GÉZA DE TAKÁTS, Chicago: There are two points I should like to bring up in closing the discussion. One is the definition of malignant hypertension. Obviously, this is the crux of the situation. If one follows the classification of Keith and Wagener closely one will note that group 4 hypertension shows papilledema, retinal hemorrhages, loss of renal function and cardiac impairment. Now, obviously, the patients in Dr. Peet's series and perhaps in Dr. Smithwick's series that were getting results in spite of a group 4 hypertension may have been in an early malignant phase. That is, they had a papilledema although the renal function was intact. In this sense I agree that this group should be operated on. However, the completely developed group 4 hypertension, with a urea clearance of 20 cc. per minute or less, in our experience has always failed to respond to surgery. About Dr. Heinbecker's discussion regarding the importance of primary vascular involvement in the kidney, we are sure that this holds for a number of cases. We are becoming more and more conscious of infectious diseases producing early arteriolar changes. In our series we have patients with hypertension, so-called essential hypertension, with well proved rheumatic infection in childhood. I am sure that rheumatic arthritis and vascular changes after toxemia of pregnancy can cause hypertension. Nevertheless the clinical results are so impressive that, regardless of where the infection came from or what the origin of the renal changes is, splanchnic nerve section should be done. In a report by Dr. Kahn there is a suggestion that if the less complete, partial sympathectomies fail, then perhaps an extension of the operation should be done such as Dr. Smithwick has suggested. That is just exactly the stage that we have gone through. Time and limitation of space did not allow me to discuss the fact, but we have had 15 patients who have five or six year follow-ups in whom high blood pressure has recurred almost to the preoperative level. Three of them were reoperated on by the Smithwick method and are now classed as cured.

Ibsen Was a Pharmacist.—The great Nordic dramatist Henrik Ibsen was a pharmacist for six years. At the age of 16 he became an apothecary's apprentice in the pharmacy of Grimstad, in three years passed the "assistant" examination and for three more years manufactured medicines and ointments in the pharmacy. Did this pharmaceutical occupation enter into Ibsen's dramatic creation? By no means, although we meet much of medical interest in his plays, and especially a rich psychopathologic casuistry, to which belong types such as Oswald Alving in Ghosts. Only in one place, where one would least expect it, in the metaphysical drama Brand, the two words quantum satis (q. s. in prescriptions) testify to Ibsen's association with pharmacy. They are found in the stirring four concluding lines of the play. Brand, the Nordic Faust, at the end of his life cries that he has sacrificed himself to the principle "all or nothing":

> "God. I plunge into death's night.
> Does not lead us to thy Light
> Manly effort's quantum satis?"

—Weiss, Frederick A.: The Pharmacist on the Stage, *Merck Report*, January 1942.

SHORT WAVE THERAPY IN THE TREATMENT OF SINUSITIS AND ALLERGIC RHINITIS

A STATISTICAL EVALUATION

GEORGE R. BRIGHTON, M.D.
VILLIAM BENHAM SNOW, M.D.
AND
HERBERT S. FRIEDMAN, M.D.
NEW YORK

The advent of short wave therapy on the therapeutic horizon in the past ten years has brought forth exorbitant claims regarding its efficacy. These have encouraged its indiscriminate use by the medical profession, often on the insistence of the patient. Our purpose in this report is to demonstrate the limitations of and indications for this increasingly popular form of physical therapy in intranasal disease by statistical analysis of 160 cases [1] of acute and chronic sinusitis and of allergic rhinitis treated by short wave therapy in Vanderbilt Clinic in the past three years.

Gale [2] in 1935 reported "it is yet too early to go into the causes for the results obtained, but, from the experience gleaned from treating fifty chronic sinus conditions, I believe the ultra short wave to be the best means of combating sinus conditions at present." Tebbutt [3] in the same year and Talia [4] two years later reported equally good results from the use of short wave therapy but extended its scope to the acute infection as well. Tamari [5] in 1932 advocated the application of this modality of physical therapy to allergic rhinitis.

More recent publications, however, have questioned the universal benefit of short wave therapy. Hollender [6] in 1939 wrote that "short wave diathermy is an effective therapeutic aid to other procedures but is practically valueless in the large majority of cases of chronic diseases of the maxillary sinus." His conclusions favor its use in acute sinus infections. The report of the Council on Physical Therapy [7] stated in 1939 that infrared and short wave diathermy "are useful adjuncts to other treatment after adequate drainage has been established. Medical diathermy is of value in the relief of pain: the frontal and maxillary sinuses are most suitable for treatment."

Our statistical survey would indicate that, at best, short wave therapy, if combined with other routine measures in common use by the otolaryngologist, is to be recommended only for the alleviation of pain and diminution of discharge in chronic and subacute sinusitis. It has no therapeutic value in allergic rhinitis and it does not appear to expedite the recovery of acute sinus infections, in which the prognosis with adequate conservative therapy has been found to be favorable.

The cases considered in this series, with the exception of the allergic group, were for the most part observed

From the Departments of Otolaryngology and Physical Therapy, Vanderbilt Clinic, Presbyterian Hospital.

1. Including 40 cases of Edmund P. Fowler Jr.
2. Gale, C. K.: Use of Ultra Short Waves in Sinus Therapy, Laryngoscope **45**: 520-525 (July) 1935.
3. Tebbutt, H. K., Jr., Effect of Physical Agents on Temperature of Nasal Sinuses, Arch. Otolaryng. **22**: 733-743 (Dec.) 1935.
4. Talia, F.: La marconiterapia nelle sinusiti croniche, Arch. di radiol. **13**: 23-31 (Jan.-April) 1937.
5. Tamari, M.: Zur Diathermiebehandlung der Rhinitis vasomotoria, Ztschr. f. Hals-, Nasen- u. Ohrenh. **31**: 490-499, 1932.
6. Hollender, A. R.: Short Wave Diathermy in Treatment of Nasal Sinusitis, Arch. Otolaryng. **30**: 749-754 (Nov.) 1939.
7. Medical Diathermy, Report of the Council on Physical Therapy, J. A. M. A. **113**: 2046 (May 20) 1939.

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DR. REGINALD H. SMITHWICK, Boston: Dr. de Takats and his collaborators have raised the question Does complete denervation of the splanchnic bed of hypertensive patients offer more in the way of persistent and significant lowering of blood pressure than does partial denervation of the splanchnic bed? The splanchnic bed is completely denervated when shortly after operation the blood pressure in the standing position completely disappears or falls to a level that is incompatible with this upright position. The splanchnic bed is partially denervated when after operation there is no significant difference between the blood pressure in the standing position as contrasted with the horizontal position. Sixty-six unselected patients had partial denervation of the splanchnic bed. There was a fairly equal representation in each stage of the disease. Significant and persistent lowering of blood pressure was obtained in 9.1 per cent of these patients. A series of 38 patients had had complete or near complete splanchnic denervation, as judged by significant fall in blood pressure in the upright position after operation. Seventy-one per cent of these have had significant and persistent lowering of the blood pressure during the period of observation. The majority of the good results or the highest percentage were in groups 1 and 2, 87 per cent. However, a very significant effect (60 per cent) has been noticed in group 3 and particularly in group 4 cases. The results in the latter group do not allow me to agree with Dr. de Takats' statement regarding malignant hypertension. I do not believe that malignant hypertension is necessarily a contraindication to surgery. My impression from this rather preliminary surgery of a very small group of patients followed for six months to two and a half years after operation is that radical denervation of the splanchnic bed has more to offer patients with hypertension than partial denervation of the splanchnic bed.

DR. CLAUDE BECK, Cleveland: Dr. de Takats deserves admiration for his well directed efforts to explore further the function of the autonomic nervous system in human hypertension. To the question as to whether or not our present surgical procedures for essential hypertension are curative the answer must be "No." However, to the question as to whether or not in properly selected cases they effect results which are sufficiently palliative to be justifiable the answer is definitely "Yes." They are not curative because they do not remove the cause. The primary seat of the disease process in cases of essential hypertension is in the blood vessel walls themselves, particularly the blood vessels of the kidney. Nowhere more than in Cleveland can it be stressed that substances derived from the kidney can modify blood pressure and the circulation. Evidence seems to indicate that there are persons who are prone to develop hypertension because of the intrinsic properties of their blood vessels. Persons most likely to develop hypertension are born with a vascular tree hyperdynamic in its response to physical, nervous and humoral influences. Denervation of the renal vessels could be expected only to check or ameliorate a process which is primary in the vessels walls themselves and capable of progression without nervous influences. That the nervous system may play a significant role in the initiation and development of human hypertension is admitted by all. In man the nervous system is probably mostly concerned in the initiation of the hypertensive state. Consequently the plea is made again that persons giving adequate evidence that they probably will develop a fixed hypertensive state should be urged to have their kidneys and adrenals denervated. The surgeon's degree of success with such cases will vary directly with the timeliness of surgical intervention. The operation for essential hypertension as generally performed results in denervation of the adrenals as well as of

the kidneys. This must result in a diminution of the amount of epinephrine released especially during stress. Experimental evidence is at hand to show that the smooth muscles of hypertensive animals respond hyperdynamically to epinephrine, and it is possible to show that epinephrine can stimulate the central nervous system directly. The symptoms from which relief is secured are "nervous" in origin. On a perfectly reasonable basis denervation of the adrenals thus could be expected to lessen the nervous response to both centrally and peripherally directed nerve impulses. This is offered as an explanation for clinical improvement from nervous symptoms in patients in whom no blood pressure drop is secured. I would voice some skepticism about the necessity of extending the scope of our surgical procedures more and more, especially when early cases are available for treatment.

DR. GEZA DE TAKATS, Chicago: There are two points I should like to bring up in closing the discussion. One is the definition of malignant hypertension. Obviously, this is the crux of the situation. If one follows the classification of Keith and Wagener closely one will note that group 4 hypertension shows papilledema, retinal hemorrhages, loss of renal function and cardiac impairment. Now, obviously, the patients in Dr. Peet's series and perhaps in Dr. Smithwick's series that were getting results in spite of a group 4 hypertension may have been in an early malignant phase. That is, they had a papilledema although the renal function was intact. In this sense I agree that this group should be operated on. However, the completely developed group 4 hypertension, with a urea clearance of 20 cc. per minute or less, in our experience has always failed to respond to surgery. About Dr. Heinbecker's discussion regarding the importance of primary vascular involvement in the kidney, we are sure that this holds for a number of cases. We are becoming more and more conscious of infectious diseases producing early arteriolar changes. In our series we have patients with hypertension, so-called essential hypertension, with well proved rheumatic infection in childhood. I am sure that rheumatic arthritis and vascular changes after toxemia of pregnancy can cause hypertension. Nevertheless the clinical results are so impressive that, regardless of where the infection came from or what the origin of the renal changes is, splanchnic nerve section should be done. In a report by Dr. Kahn there is a suggestion that if the less complete, partial sympathectomies fail, then perhaps an extension of the operation should be done such as Dr. Smithwick has suggested. That is just exactly the stage that we have gone through. Time and limitation of space did not allow me to discuss the fact, but we have had 15 patients who have five or six year follow-ups in whom high blood pressure has recurred almost to the preoperative level. Three of them were reoperated on by the Smithwick method and are now classed as cured.

Ibsen Was a Pharmacist.—The great Nordic dramatist Henrik Ibsen was a pharmacist for six years. At the age of 16 he became an apothecary's apprentice in the pharmacy of Grimstad, in three years passed the "assistant" examination and for three more years manufactured medicines and ointments in the pharmacy. Did this pharmaceutical occupation enter into Ibsen's dramatic creation? By no means, although we meet much of medical interest in his plays, and especially a rich psychopathologic casuistry, to which belong types such as Oswald Alving in Ghosts. Only in one place, where one would least expect it, in the metaphysical drama Brand, the two words quantum satis (q. s. in prescriptions) testify to Ibsen's association with pharmacy. They are found in the stirring four concluding lines of the play. Brand, the Nordic Faust, at the end of his life cries that he has sacrificed himself to the principle "all or nothing":

> "God. I plunge into death's night.
> Does not lead us to thy Light
> Manly effort's quantum satis?"

—Weiss, Frederick A.: The Pharmacist on the Stage, *Merck Report*, January 1942.

SHORT WAVE THERAPY IN THE TREATMENT OF SINUSITIS AND ALLERGIC RHINITIS

A STATISTICAL EVALUATION

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The advent of short wave therapy on the therapeutic horizon in the past ten years has brought forth exorbitant claims regarding its efficacy. These have encouraged its indiscriminate use by the medical profession, often on the insistence of the patient. Our purpose in this report is to demonstrate the limitations of and indications for this increasingly popular form of physical therapy in intranasal disease by statistical analysis of 160 cases [1] of acute and chronic sinusitis and of allergic rhinitis treated by short wave therapy in Vanderbilt Clinic in the past three years.

Gale [2] in 1935 reported "it is yet too early to go into the causes for the results obtained, but, from the experience gleaned from treating fifty chronic sinus conditions, I believe the ultra short wave to be the best means of combating sinus conditions at present." Tebbutt [3] in the same year and Talia [4] two years later reported equally good results from the use of short wave therapy but extended its scope to the acute infection as well. Tamari [5] in 1932 advocated the application of this modality of physical therapy to allergic rhinitis.

More recent publications, however, have questioned the universal benefit of short wave therapy. Hollender [6] in 1939 wrote that "short wave diathermy is an effective therapeutic aid to other procedures but is practically valueless in the large majority of cases of chronic diseases of the maxillary sinus." His conclusions favor its use in acute sinus infections. The report of the Council on Physical Therapy [7] stated in 1939 that infrared and short wave diathermy "are useful adjuncts to other treatment after adequate drainage has been established. Medical diathermy is of value in the relief of pain: the frontal and maxillary sinuses are most suitable for treatment."

Our statistical survey would indicate that, at best, short wave therapy, if combined with other routine measures in common use by the otolaryngologist, is to be recommended only for the alleviation of pain and diminution of discharge in chronic and subacute sinusitis. It has no therapeutic value in allergic rhinitis and it does not appear to expedite the recovery of acute sinus infections, in which the prognosis with adequate conservative therapy has been found to be favorable.

The cases considered in this series, with the exception of the allergic group, were for the most part observed

From the Departments of Otolaryngology and Physical Therapy, Vanderbilt Clinic, Presbyterian Hospital.

1. Including 40 cases of Edmund P. Fowler Jr.
2. Gale, C. K.: Use of Ultra Short Waves in Sinus Therapy, Laryngoscope **45**: 520-525 (July) 1935.
3. Tebbutt, H. K., Jr., Effect of Physical Agents on Temperature of Nasal Sinuses, Arch. Otolaryng. **22**: 733-743 (Dec.) 1935.
4. Talia, F.: La marconiterapia nelle sinusiti croniche, Arch. di radiol. **13**: 22-31 (Jan.-April) 1937.
5. Tamari, M.: Zur Diathermiebehandlung der Rhinitis vasomotoria, Ztschr. f. Hals-, Nasen- u. Ohrenh. **31**: 490-499, 1932.
6. Hollender, A. R.: Short Wave Diathermy in Treatment of Nasal Sinusitis, Arch. Otolaryng. **30**: 749-754 (Nov.) 1939.
7. Medical Diathermy, Report of the Council on Physical Therapy, J. A. M. A. **112**: 2046 (May 20) 1939.

and treated during the unseasonable winter and spring months. It is not within the scope of this survey to consider climatic factors, bacterial flora and other less obvious variables. Rather, it has been our aim to analyze the therapeutic results in a moderate sized group, showing a cross section of the incidence of sinusitis in this locality.

THEORETICAL CONSIDERATIONS

The effect of short wave diathermy on man was noted by Gale [8] in 1927 when he reported the rise in temperature in workmen exposed to high frequency electric currents in the vicinity of radio transmitters. The striking property of oscillations below 30 meters to pass through mediums of poor electrical conductivity was well illustrated by this worker. An 8 meter wave was passed through a series of glass receptacles containing, in order, 0.1 per cent potassium permanganate, tap water and a 3 per cent salt solution. At the end of ten minutes the salt solution had risen in temperature from the room level of 78 F. to 93 F., while the other fluids changed less than 3 degrees F. The concentration of short wave heating effect in good conductors as compared with those in poorer conductors is the rationale for heating the nasal and sinus mucous membrane. The ability of short wave emanations to penetrate bone is likewise of basic importance.

In conventional long wave diathermy machines the frequency employed is usually in the region of 1 million cycles a second (wavelength 300 meters) while in the short wave machines 10 to 50 million oscillations per second are produced (30 to 6 meter wavelengths). Short wave currents have the great advantage over diathermy emanations in that they permit transmission from machine to patient without metallic contact. This greatly reduces the danger of burns and adds to the ease of application of short wave machines. In calculating the dosage in short wave therapy the "lamp load" output of a machine is only of relative importance because of the great number of variables in technics of application: the patient's tolerance is the most important guide.

TABLE 1.—*Allergic Rhinitis*

Number of Cases	Patients Showing Significant Improvement on Short Wave Therapy	Patients Showing Improvement After 3 Month Follow-Up	Patients Showing No Change During or After Therapy
25	16%	0%	84%

The opinion of most American observers concerning tissue heating is that differences in power output of the machine and the technic employed play a more vital role than the actual length of the short wave, per se. The preference expressed by many continental observers for the shorter wavelengths (6 to 12 meters) in intranasal therapy seems to be based on acceptable clinical evidence. The use of the 1 and 2 meter machines now being employed by a few workers has not been adequately reported.

There has been a tendency to ascribe to short wave action on human tissue many mysterious therapeutic properties other than the production of heat. Specific bactericidal effects,[8] antibody formation,[9] histamine-like response [10] and athermic action [11] have all been defended. But, as pointed out by Hollender, who quotes the Council on Physical Therapy,[8] "In the light of present observations the consensus seems to be that no physiologic effects other than those attributable to heat have been substantiated."

In the light of our present knowledge, the action of heat in the nasal mucous membranes may be said to be one of hyperemia and hyperlymphia. By dilating the vascular bed and stimulating the flow of lymph, heat artificially aids in much the same way as any natural inflammatory process in controlling local infections

TABLE 2.—*Acute Purulent Sinusitis*

Number of Cases	Per Cent Showing Decided Improvement	Per Cent Showing Moderate Improvement	Per Cent Showing No Improvement or Worse
25	32	44	24

processes. Should adequate nasal and sinus drainage exist, the beneficial results of heat produce their maximum effect.

However, in a nondraining empyema of a closed sinus space the increased turgescence and secretion of the nasal mucous membrane simply adds to the pain and tenderness already present. As mentioned by Titus,[12] "it is important first to shrink down the nasal mucous membrane so that the natural openings of the sinuses may be available to give relief from the pressure which will obviously be increased by the treatment." We are furthermore of the opinion that, in those acute cases in which simple shrinkage does not afford adequate sinus drainage, sinus irrigations by natural ostium or trocar, and not short wave therapy, are the procedure of choice after a trial period of ten days to two weeks has elapsed.

TECHNICAL CONSIDERATIONS

Selectivity of tissue heating in the short wave field occurs in inverse relation to the frequency of the oscillations. Presumably the shorter the wavelength of the apparatus used (more frequent oscillations) the more uniform will be the heat generated in the tissue.

To date the accepted version of the effects of short wave in therapy is that any favorable result is brought about by the heat produced in the tissue treated and by the accompanying physiologic response to such heat.

Many claims have been made for short wave in treatment of sinus disease, and in checking these it appears to us that wavelengths throughout the entire range of commercially available equipment have been utilized and reported on with varying degrees of enthusiasm.

Physically one would expect the most uniform heating of bone underlying soft tissues using commercial equipment at 6 meters. The additional advantages of all 6 meter equipment is the fact that it permits the use of space or noncontact electrodes with arms. This method of application over the face is uniformly simple and convenient.

We wished to secure some of the advantages of this method of application and also wished to ascertain deliberately the effect of short wave out of the 6 meter range. We selected an apparatus, A. M. A. Council accepted, of 12 meters with sufficient output to permit the use of arms with spacing. We feel that any favor-

8. Schliephake, Erwin: Importance of Ultra-High Frequency Therapy, Arch. Phys. Therapy **14**: 389-392 (July) 1933.
9. Jouard, Farel: Rationale of Short Wave Diathermy in Acute Sinusitis, Arch. Phys. Therapy **20**: 338-339 (June) 1939.
10. Wolf, H. F.: Experimental Studies on Specificity of Short Wave Diathermy, Arch. Phys. Therapy **18**: 358-362 (June) 1937.
11. Tomberg, Victor: Athermic Short Wave Effects and Athermic Therapy, Strahlentherapie **59**: 373 (June 20) 1937.
12. Titus, N. E., in discussion on Jouard.[9]

able result at this wavelength would be more representative of similar effects to be expected both above and below this point in the short wave scale.

The machine, a standard model, employs four tubes and operates on 60 cycles, 103-130 volts. The lamp load output is 400 watts with a maximum input of 1,200 watts.

Application.—In all cases a disk 7 inches in diameter was placed over and parallel to the nose and forehead of the patient, the electrode centered over the bridge of the nose. The other electrode was placed anteriorly over the sternal region, the edges of the disks approximately 11 inches apart.

The facial electrode was pressed firmly in contact with the nose and forehead, only six thicknesses of thin linen towel separating the electrode from the skin. (If this electrode is not in firm contact, uneven heating occurs and much prickling and potential burning.)

The sternal electrode was placed at a distance of 3¼ inches from the anterior chest wall with air spacing only.

By this technic the maximum heat is felt over the anterior face. Less heat is always produced beneath the other electrode. The current was turned to the maximum tolerance of each patient.

The duration of the application was fifteen minutes.

Frequency.—Treatments in acute cases were given daily and preceded immediately by the usual nasal procedures to assure free drainage. In the chronic cases the treatments were given three times a week. The maximum number of treatments in all cases was limited to six weeks, with a total of eighteen treatments in chronic cases.

SHORT WAVE THERAPY IN THE TREATMENT OF ALLERGIC RHINITIS

Twenty-five typical cases of allergic rhinitis as proved by history, cutaneous tests and clinical findings were treated by short wave therapy. In 6 of this number, in which there was a history of seasonal attacks of coryza, therapy was given three weeks before the allergic

TABLE 3.—*Symptoms of Acute Purulent Sinusitis*

	Number of Cases * Showing Symptom	Per Cent Decidedly Improved	Per Cent Moderately Improved	No Change or Worse
Headache (pain)	21	38	33	29%
Discharge	25	31	41	28%
Obstruction	9	22	33	45%
Tenderness	14	14	35	51%
Postnasal drip	15	20	53	27%

* Total number of cases, 25.

period as well as three weeks after the appearance of the acute symptoms. All 25 patients received the usual dosage of short wave therapy three times a week for a total of six weeks.

Our results are summarized in table 1. It is apparent that none of our allergic patients showed any permanent benefit from short wave therapy and that only 16 per cent revealed significant temporary relief from any or all of their complaints, which included nasal discharge and obstruction, sneezing and conjunctival irritation.

ACUTE SINUSITIS

Another group of 25 patients suffering acute purulent infections of the paranasal sinuses were treated by short wave therapy. Patients in this group gave histories of symptoms of less than three weeks' duration and of no previous sinus infections. The great majority of our cases were of maxillary or frontal empyema but accompanying ethmoid and sphenoid disease was present in a few. Diagnosis was determined by the usual clinical and x-ray methods.

In these acute cases, short wave therapy was applied three or five times a week for two weeks. In 18 of the cases daily clinic therapy consisted of nasal shrinkage and irrigation as well as home administration of benzoin or menthol inhalations. In the other 7 cases in this series only ephedrine drops for home application were prescribed.

TABLE 4.—*Chronic Sinusitis*

	Number of Cases	During Short Wave Therapy: Per Cent Decidedly Improved	During Short Wave Therapy: Per Cent Moderately Improved	During Short Wave Therapy: No Change or Worse	At 3 Month Follow-Up, per Cent Showing Improvement
Purulent	38	24	12	64%	8
Nonpurulent	72	62	13	25%	19

* Total, 110 cases.

Table 2 summarizes the results obtained in the acute sinusitis group. In 32 per cent of the cases studied there was significant and rapid resolution of symptoms within five days and a somewhat more gradual appearance of objective improvement. Forty-four per cent of the patients were moderately relieved of their acute symptoms after two weeks, leaving in all 24 per cent, or about one fourth, who showed no improvement or became worse on the regimen described.

These persistent cases, which must be classed as failures, responded well to antral irrigations by trocar or natural osteal, frontal and sphenoid washings and, in 1 case of frontal sinusitis, to removal of the anterior tip of the middle turbinate. A 5 per cent solution of zinc peroxide instilled through trocar or cannula was found to be of special value in antrums yielding a foul, broken down, purulent discharge.

Of the special group of 7 patients treated only by short wave therapy and ephedrine drops applied by the patient, 4 were destined to fall into the failure class. These patients occasionally complained of increased headaches and transitory dizziness following physical therapy.

Table 3 analyzes these 25 cases of acute sinusitis by considering the effect of short wave therapy on the more common symptoms and signs, individually, when present. These include headache or localized pain, nasal discharge, obstruction to breathing, sinus tenderness and postnasal drip.

Of interest in this analysis is the fact that no single sign or symptom was greatly relieved by short wave therapy in over 38 per cent of the cases. The most universal improvement was seen in relief of headache, while in those 14 patients suffering from sinus tenderness only 16 per cent were significantly relieved and 50 per cent became worse or showed no improvement on physical therapy. We are of the opinion that the finding of maxillary, ethmoid or frontal tenderness indicates sinus involvement of a severe degree and usually with poor drainage. These factors may account for the very poor results of short wave therapy in patients showing this sign, and our results would contraindicate physical therapy until drainage has been established.

CHRONIC SINUSITIS

One hundred and ten patients suffering from chronic sinus disease were treated by short wave diathermy three times a week for six weeks. In this series 38 patients were shown by x-ray examination and sinus irrigations to have a purulent involvement of one or more paranasal cavity. During six weeks of physical therapy, as shown in table 4, 24 per cent of the group designated as chronic purulent sinusitis reported symptomatic relief. However, when again reviewed three months later, only 8 per cent of this series had maintained any prolonged benefit from their short wave therapy. Although observed regularly in the ear, nose and throat clinic during their period of physical therapy, these patients received only symptomatic rhinologic therapy such as tampons of mild protein silver and nasal irrigations. Sinus irrigations were performed only for diagnosis and relief of pain. In several cases a decrease in the amount of intranasal secretion and mucosal edema was noted, but no cases were seen in which sinuses previously black on transillumination or x-ray examination became appreciably clearer. In both this and the chronic nonsuppurative group to be considered next, most improvement claimed was symptomatic rather than objective.

TABLE 5.—*Symptoms of Chronic Sinusitis*

	Number* of Cases Showing Symptom	During Short Wave Therapy			At 3 Month Follow-Up, per Cent Showing Improvement
		Per Cent Decidedly Improved	Per Cent Moderately Improved	No Change	
Headache (pain)	78	72	20	8%	48
Discharge	50	48	27	25%	18
Obstruction	62	38	28	34%	22
Tenderness	30	6	56	38%	0
Postnasal drip	52	50	32	18%	14
Associated upper respiratory infection	10	50	10	40%	40

* Total, 110 cases.

Seventy-two patients with chronic nonpurulent sinusitis were observed during a six week course of short wave therapy. In this group the typical findings were hyperplastic nasal membranes with perhaps a mucoid discharge on occasion but no purulent discharge. (Nine of these patients, to be discussed separately, had previous multiple intranasal operations.) These patients complained of one or all of that familiar quartet mucoid nasal discharge, postnasal drip, headache and nasal obstruction. As presented in table 4, 62 per cent of the patients felt much improved during physical therapy, but of this number only 19 per cent were clinically or symptomatically benefited after a three month follow-up.

The more frequent signs and symptoms of the entire 110 cases of chronic sinusitis are considered individually in table 5. Again we find the highest percentage of success to be in the relief of headache. In this symptoms group 72 per cent of the patients reported improvement during short wave therapy and 48 per cent showed continued relief three months later. Thirty patients complaining of sinus tenderness were entirely unaided by short wave on three month follow-up and only 6 per cent benefited during their six week course of therapy. Relief from recurrent upper respiratory infection was reported by 5 patients of 10 who volunteered this as their outstanding complaint.

Nine patients classed in the chronic nonpurulent sinusitis group who had previously undergone multiple sinal operations but who presented themselves with continued nasal complaints were studied during a six week course of physical therapy. Two of these patients were greatly benefited by short wave treatment, while 4 more reported partial relief from their complaints.

COMMENT

The negligible effect of short wave therapy on allergic rhinitis is not unexpected. In our clinical studies the usual immediate post-therapeutic effect of short wave application has been one of increased turgescence of the nasal mucous membranes. We have failed to note any secondary dehydration of more than a temporary nature which might successfully influence the mucosal edema of allergic rhinitis.

Our statistics in the acute purulent sinusitis group reveal that 24 per cent, or about one fourth of our cases, did not respond to short wave therapy combined with simple nasal shrinkage. While these figures compare unfavorably with those of Furstenberg,[13] who reports 95 per cent cures on simple nasal therapy in a carefully controlled group of college students living in a more sheltered environment, they closely approach the average of clinic groups in this section of the country. It would therefore appear that the added expense and time required by short wave therapy does not appear to be indicated in the acute sinusitis sufferer until other simple otolaryngologic methods have failed. Those cases presenting sinus tenderness particularly contraindicate short wave therapy, as they usually signify inadequately draining sinuses and are rendered worse through increase of the edema and secretion of mucous membrane lining these cavities.

For the patient with chronic suppurative sinusitis we believe that sinus irrigations and intranasal operative measures facilitating drainage are the procedures of choice, as only 8 per cent of our patients showed persistent (three month) improvement in their symptom complex on short wave therapy.

In the nonsuppurative group, however, we have found that short wave therapy is of distinct benefit. It is this group that is particularly resistant to any form of therapy, and it is here we find that a total of 77 per cent (62 and 15 per cent) of our patients were aided during their course of physical therapy.

Of note in this group are those unfortunates who after multiple intranasal operations still persist in their symptoms. In a small but significant group of 9 patients of this refractory type, 6 showed much or moderate benefit from the application of short wave treatment.

SUMMARY

1. Short wave therapy is employed indiscriminately in many intranasal conditions in which it does little good and may do harm.

2. It is of no value in allergic rhinitis.

3. Its application in acute sinusitis even in conjunction with nasal shrinkage and irrigations does not produce results superior to conservative nasal therapy alone.

4. In cases of chronic nonpurulent sinusitis which present, in general, a poor prognosis it is of definite benefit, particularly in the relief of headaches.

13. Furstenberg, A. C.: Treatment of Acute Nasal Accessory Sinus Disease, Tr. Am. Laryng. A. **60**: 240-254, 1938.

OBSERVATIONS ON THE TOPICAL USE OF SULFONAMIDE DERIVATIVES

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The ability of the sulfonamide derivatives to prevent infections in wounds when applied locally has now become well established. The fact has been repeatedly demonstrated in experimental, operative and traumatic lesions and has been fully reported.[1] It is possible by means of such topical application to create not only a high concentration of the drug in the tissue fluids surrounding the lesion but to maintain a degree of hemoconcentration varying from 3 to 4 mg. per hundred cubic centimeters in twenty-four hours to a residual trace a week later following the use of 10 to 15 Gm. in large wounds. While a hemoconcentration at this level is hardly sufficient to combat an established septicemia of any real intensity, it is apparently high enough to prevent its development from a properly treated contaminated wound. The subject is now sufficiently advanced that generalizations on end results in terms of gross infection are no longer sufficient, and more detailed consideration of different aspects of the problem are required.

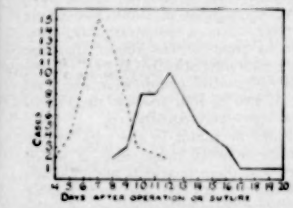

Fig. 1.—Effective healing time. Solid line, group treated with sulfonamide derivatives; broken line, control group.

In Key and Burford's[2] 1940 report the suggestion was made that the topical application of sulfanilamide might delay the healing time of wounds of the soft tissues. They thought that it did, but to an inconsiderable degree. In their later report[3] of 1941 it was stated that the use of smaller quantities of the crystals (in the order of 5 Gm.) had proved equally effective and did not cause any apparent delay in healing. Retarded wound healing had been noticed by others in reports on the general problem and has been as frequently denied. In view of this discrepancy I have studied a varied series of cases solely from the point of view of wound healing.

Fifty cases of traumatic and operative wounds of the soft tissues were chosen to be treated by a standard technic consisting of thorough washing with green soap and water and, where indicated, débridement, and saline irrigation followed by simple unmedicated dressings. Primary suture was employed to the extent which the wound permitted, that is, was total in all but a few complex traumatic wounds and plastic procedures in which certain crushed areas did not permit perfect apposition of skin edges. The more extensive lesions were immobilized by splints, plaster of paris or traction. Powdered sulfanilamide or sulfathiazole was applied in quantities varying from 1.5 to 10 Gm., sufficient to cover all surfaces of the wound. Massive packs of the powder which might form an obvious block to surface approximation were avoided. (The question of the relative bacteriostatic action of these drugs will not be considered here; only their effect on wound healing.) As a control fifty operative and traumatic wounds were observed in which treatment was identical except that no sulfonamide derivative or other medication was used.

Fig. 2.—Healing five days after tenodesis of shoulder.

In the control group there were four superficial wound infections; in the sulfonamide group there was one infection occurring in a case in which Kirschner wire was used as internal fixation. None of these infections were serious, and all cleared up easily when the wounds were exposed.

Observations were made at frequent intervals, in some cases daily, until effective healing had taken place. By effective healing of a wound is meant the surface to surface apposition of skin and subcutaneous tissues characteristic of primary union of sufficient cohesive strength that on removal of the sutures the apposition remained. During the process of healing a decided difference was observed in the tissue reaction of most of the patients treated with sulfonamide derivatives as against the control group. In the former occurred some features which, had they appeared in nontreated wounds would have indicated, or at least suggested, deep infection. The wound edges were apt to be reddened, often somewhat swollen and, where granulation tissue was exposed, showed a grayish cast. On several occasions infection was suspected and the wounds probed respectively four, five and eight days after primary suture or operation. Finely granular clumps of sulfonamide derivatives were found still unabsorbed and small quantities extended through the openings. Serosanguineous fluid was commonly found on the dressings and could be expressed from the lesion up to the point

Fig. 3.—Healing two weeks after tenodesis of shoulder.

Read before the combined meeting of the Orthopedic Section of the New York Academy of Medicine and the Philadelphia Orthopedic Club, Nov. 21, 1941.

1. Jensen, N. K.; Johnsrud, L. W., and Nelson, M. C.: The Local Implantation of Sulfanilamide in Compound Fracture, Surgery **6**:1 (July) 1939. Harrell, W. E., and Brown, A. E.: Local Use of Sulfanilamide Compounds in the Treatment of Infected Wounds, Proc. Staff Meet., Mayo Clin. **15**:611 (Sept. 25) 1940. Campbell, W. C., and Smith, Hugh: Sulfanilamide and Internal Fixation in Treatment of Compound Fractures, J. Bone & Joint Surg. **23**:959 (Oct.) 1941. Colebrook, Leonard, and Francis, A. E.: Local Use of Sulfanilamide Powder in Wounds, Lancet **1**:271 (March 1) 1941. Key and Burford, footnotes 2 and 3.

2. Key, J. A., and Burford, T. H.: The Local Implantation of Sulfanilamide in Compound Fractures, South. M. J. **33**:449 (May) 1940.

3. Key, J. A., and Burford, T. H.: Prophylactic Implantation of Sulfanilamide in Clear Operative Wounds for Reduction of Postoperative Infections, Surg., Gynec. & Obst. **73**:324 (Sept.) 1941.

of complete healing. Mixed with the granules the resemblance to ordinary pus was striking. Key's recent observation that the extent of wound reaction decreases with the amount of drug used was confirmed. It may be possible that future observations will disclose a minimum effective dose that will eliminate this reaction, at least to a large extent. It is important that, meanwhile, the surgeon using topical sulfonamide derivatives be acquainted with this and bear in mind that it is merely a phase in normal healing under the circumstances. If this picture is appreciated, unnecessary probings, early suture removals and secondary wound exposures will be avoided. The appearance is best described as that of a noninfected foreign body reaction in the subcutaneous tissues.

Fig. 4.—Healing twelve days after medial meniscectomy.

In the present series of cases there was no question that wound healing was delayed when powders were implanted locally. This applied even to the cases in which the tissue reaction described was slight. The delay was considerable, representing on the average between 50 and 75 per cent of the time factor. Dressings done on simple lacerations or cleancut incisions were still oozing serosanguineous fluid on the fifth or seventh days in almost all of the cases treated with sulfonamide derivatives and were generally dry in the control cases. In the former, healing was not complete for ten to twelve days and often only in part of the wound surface at that time. In the chart the difference in healing time between the two groups is expressed by a graph. The points represent as nearly as could be determined clinically the time at which wound healing was considered effective. It is conceded that in so expressing these data a large margin of error must be allowed, but it is also submitted that the same margin applies to the two groups. This delay in healing not only causes longer hospitalization or attendance at the clinic but, of greater importance in extremity surgery, delayed the time in which active motion or local massage might have been instituted.

The hair line scar characteristic of primary union in an area of minimal skin stress which occurred normally among the control group was almost never observed among the patients treated with sulfonamide derivatives. With few exceptions in comparable areas the scar of the treated group remained broader at equivalent time intervals than did those of the controls. Since each scar is a unique phenomenon whose multiple factors cannot be duplicated even experimentally, there is no way of submitting comparable measurements. However, among the various types of cases the Jones or anteromedial crescentic incision for excision of a medial meniscus of the knee joint was chosen for comparison. These incisions are as closely comparable in location, size and depth as are obtainable in surgery of the extremities. Twelve of these were in the cases in which sulfonamide derivatives were used and 14 were in the control group. At any stage of their healing one could distinguish a case belonging to one or the other group with few errors simply by observing the healing scar. In general this observation applied to all comparable cases. The healing of a wound or incision treated with a sulfonamide derivative is very apt to leave a scar of greater breadth and depth than would be formed in a similar instance of primary union when the drug was not used.

It was first thought that the use of a sulfonamide derivative locally left a larger mass of subcutaneous fibrosis than did the untreated cases. This is true in the early weeks of healing. In 2 cases in which secondary operations were necessary the subcutaneous masses were found to resemble grossly the dense grayish tissue characteristic of healing in slowly subsiding infections. Since this was found only in connective tissue areas and since in no case did the deeply palpable masses appear to involve muscle or synovial tissue, it was felt that the sulfonamide derivatives might have the effect of selective stimulation of connective tissue cells. This is here recorded as a temporary phenomenon. With passage of time it was found that the subcutaneous masses characteristically larger in the treated cases than in the control group were absorbed so that in the space of two to four months the tissues beneath the cutaneous scars were equally free.

Few differences could be found in the rate or the type of effective healing between those cases in which sulfathiazole was used and those in which sulfanilamide was used. At this writing it appears that sulfathiazole is somewhat less irritating than sulfanilamide. Further observations will be needed to confirm this. The rate of healing was not significantly different, but apparently because of the less irritant quality a finer scar remained in most instances. Since the most common postoperative contaminant in extremity surgery is the staphylococcus, sulfathiazole is theoretically the more desirable; but since the anaerobes and streptococci are the most common contaminants of traumatic wounds,

Fig. 5.—Healing twelve days after external meniscectomy.

sulfanilamide is the obvious choice in such cases. The newer drug sulfadiazine, now commercially available, will be tried in the near future.

In 27 cases the sulfonamide derivatives were applied to wounds in which joint or tendons were exposed. In these instances the drugs remained in contact with synovial and tendon sheath surfaces. At this time no particular unfavorable joint or tendon sheath reactions have been observed in any of the cases and there has been no residual dysfunction peculiar to these applications. This series will be continued and reported later.

CONCLUSIONS

The local applications of sulfonamide drugs to wounds of the soft tissues or cleancut operative incisions in which primary suture is indicated retards healing by at least 50 per cent of the time factor and promotes excessive cutaneous scarring. In extremity surgery this delay in healing time may postpone necessary active motion and massage; in plastic skin repair it may interfere with a cosmetic result. Therefore, unless infection is anticipated because of the circumstances of the lesion or of the operation, the use of topical sulfonamide therapy may be an unnecessary burden. However, its use in cases in which infection may be anticipated, such as in wounds contaminated under field conditions, is now almost obligatory.

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THE USE OF SULFONAMIDE DERIVATIVES

AS A SOLUTION TO THE PROBLEM OF BACTERIAL CONTAMINATION IN STORED PLASMA

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Bacterial contamination has been the most serious obstacle to the preservation of plasma in the liquid state. Several methods have been proposed to minimize the dangers involved in the accidental use of contaminated plasma,[1] but none previously proposed have proved adequate. We have instituted the use of the sulfonamide group of drugs in stored plasma as bacteriostatic and bactericidal agents. In all of my experimental work and in actual routine clinical usage over a two year period the method has been found to be completely satisfactory regardless of the temperature (4 C.-24 C.) or duration of storage. The quantity of the drug necessary to accomplish the purpose in stored plasma is small, so that there are no noteworthy contraindications to its routine use.

The sulfonamide drugs may be used in conjunction with any of the methods of processing plasma now available. However, since the danger of bacterial contamination of plasma is the most serious objection to storing it in the liquid states, the addition of these drugs to such material makes it possible for hospitals to depend on the safety of plasma stored in the fluid form. This method lends itself conveniently to civil and military use. The expensive and elaborate methods for processing this essential material thus becomes unnecessary in most instances.

SOURCES OF BACTERIAL CONTAMINATION

Regardless of the care used in the collection and handling of blood or plasma, the chances of bacterial contamination are numerous. The facts that bacteria geminate on the average every thirty minutes and that this occurs whenever they are present in a fluid menstruum and that many species grow even at refrigerator temperatures magnify the seriousness of the problem. Since plasma is in the liquid state for a period of time in all the methods proposed for processing it, i. e. before freezing or desiccation or after reconstitution by thawing or redissolving, it is apparent that in these instances favorable circumstances exist for bacterial multiplication. All these procedures involve accidental contamination by organisms in the air and from the cutaneous surface which harbors a multitude of bacteria, many of which are still viable even after the most scrupulous care in the preparation of the cutaneous area prior to phlebotomy. It has been shown that absolute antisepsis of the cutaneous surface is not possible[2] and that the hypodermic needle in its passage through the skin may carry with it residual bacteria. Furthermore, a transient asymptomatic state of bacteremia does exist in patients from time to time owing to the entrance of intestinal bacteria into the portal system so that, in spite of every possible care, the blood obtained may contain organisms well adapted to this particular environment. The practice of pooling blood samples, in itself a bacteriologically hazardous procedure, makes possible the contamination of large quantities of plasma. One might include the more limited, specialized technic of obtaining blood from placental sources with the obvious sources of contamination involved.

It is true that in most of these instances the bacteria involved are not true pathogens. It must be emphasized, however, that the sources of greatest trouble are saprophytic species. The latter produce pyrogenic and other toxic substances which, when injected directly into the blood stream, produce a maximum deleterious physiologic effect. The kind of organism present, therefore, is less important than the number of bacteria in such material, since a large number implies the presence of reaction-provoking substances. As the original contamination seldom consists of more than a few organisms, it is clear that if they are prevented from multiplying the dangers are largely eliminated. In the use of the sulfonamide derivatives it has been shown that they not only exert this desirable effect but over a period of time actually effect sterilization of contaminated samples.

INADEQUACIES OF STERILITY TESTS

If contamination does occur despite the use of ordinary care in the collection of blood by means of the closed system, the inoculum obviously will be very minute. The manipulations of pooling, centrifuging and transferring plasma present additional possibilities for a minimal contamination. In view of this, random sampling of the material for sterility tests before the organisms have multiplied in the original specimen gives results that are open to question, since the chance of including one of the bacteria in the small sample removed for culture is remote. If the plasma is incubated or

1. Reported by:
Edwards, F. R.; Kay, J., and Davies, T. B.: The Preparation and Use of Dried Plasma for Transfusion, Brit. M. J. 1:377 (March 9) 1940.
Elser, W. J.; Thomas, B. A., and Steffen, G. L.: Desiccation of Sera and Other Biological Products (Including Micro-Organisms) in the Frozen State with Preservation of Original Qualities of Products so Treated, J. Immunol. 28:433 (June) 1935.
Flosdorf, E. W., and Mudd, Stuart: Procedure and Apparatus for Preservation in "Lyophile" Form of Serum and Other Biological Substances, ibid. 29:389 (Nov.) 1935; An Improved Procedure and Apparatus for Preservation of Sera, Micro-Organisms and Other Substances—The Cryochem Process, ibid. 34:469 (June) 1938.
Flosdorf, E. W.; Stokes, F. J., and Mudd, Stuart: The Desivac Process for Drying from the Frozen State, J. A. M. A. 115:1095 (Sept. 28) 1940.
Greaves, R. I. N., and Adair, M. E.: High Vacuum Condensation Drying of Proteins from the Frozen State, J. Hyg. 39:413 (July) 1939.
Hartman, F. W.: Use of Cellophane Cylinders for Desiccating Blood Plasma: Rapid and Bacteriologically Safe Method, J. A. M. A. 115:1989 (Dec. 7) 1940.
Hill, J. M., and Pfeiffer, D. C.: A New and Economical Process Particularly Suitable for the Preparation of Concentrated Plasma or Serum for Intravenous Use: The Adtevac Process, Ann. Int. Med. 14:201 (Aug.) 1940.
Strumia, M. M.; McGraw, J. J., and Reichel, J.: Freezing of Plasma and Preservation in the Frozen State, Am. J. Clin. Path. 9:389 (May) 1941; Drying of Plasma by Low Temperature Condensation in Vacuo, June 1941.
Strumia and McGraw.[3]

2. Novak, Milan, and Hall, Harry: A Method for Determining the Efficiency of Preoperative Skin Sterilization, Surgery 5:560 (April) 1939.

stored for a period of time prior to the conducting of sterility tests, contamination is then easily demonstrated by routine sampling; but the original material must be discarded. It is to be remembered also that the sampling procedure itself is hazardous and may introduce a contaminant into sterile plasma.

TABLE 1.—*Organism Vibrio Sp.*

Days	Control	Sulfanilamide 0.02%	Sulfanilamide 0.05%	Sulfanilamide 0.1%	Sodium Sulfapyridine 0.02%	Sodium Sulfapyridine 0.05%	Sodium Sulfapyridine 0.1%	Sodium Sulfathiazole 0.02%	Sodium Sulfathiazole 0.05%	Sodium Sulfathiazole 0.1%
Storage at Room Temperature (20-24 C.)										
0	410	210	410	400	340	220	430	210	220	90
3	10^6+	0	0	0	20	0	0	0	0	0
10	10^6+	0	0	0	10	0	0	0	0	0
30	10^6+	0	0	0	0	0	0	0	0	0
70	10^6+	0	0	0	10	0	0	0	0	0
Storage in Refrigerator (4-6 C.)										
0	200	400	420	450	220	440	370	440	140	200
3	10^6+	410	420	400	220	512	380	900	450	10
10	10^6+	30	10	10	60	10	0	10	0	0
30	10^6+	10	0	0	0	0	0	10	20	0
70	10^6+	10^6+	10^6+	0	8,900	0	0	91,400	8,700	0

Because of these important considerations a bactericidal substance acting on the original chance contaminant is of practical importance. It has been found that the sulfonamide compounds, when incorporated into the citrate solution, solve all the difficulties of contamination from various sources. These drugs exert their bacteriostatic action from the instant the blood is drawn and, over a period of a few days, actually kill the bacteria present. Contaminated plasma is thus actually rendered safe for use. In our experience [3] as well as that of others,[4] merthiolate (sodium ethyl mercurithiosalicylate) has been found to be inadequate for this purpose.

EXPERIMENTAL DATA

Human citrated (0.3 per cent) blood plasma was used in the experiments. Five or 10 cc. quantities were placed into sterile tubes and increasing amounts of the sulfonamide derivative under investigation were added to each successive tube. Final concentrations of the drugs ranged from 0.02 to 0.1 Gm. per hundred cubic centimeters of plasma. Owing to limitations of solubility, the sodium salt of the drug was used whenever indicated. Each tube, as well as a control containing plasma without the compound, was inoculated with 0.1 cc. of a saline dilution of the culture so that the final inoculum was less than 500 organisms per cubic centimeter of plasma. In some instances a larger inoculum was used. With the dilution-plating technic, the number of bacteria introduced into each tube was determined by culturing 0.1 cc. quantities of plasma on nutrient agar. The tubes were then placed in a refrigerator at 4 C. to 6 C. A duplicate set of tubes was allowed to remain at room temperature (20-24 C.). Subsequent periodic enumeration of the bacteria present in each tube was carried out at various intervals of time.

The drugs investigated included sulfanilamide, sulfapyridine, sulfathiazole and sulfadiazine. The bacteria used were in all instances from sources which have an application to the problem in question. One hundred and fourteen strains have been investigated over a two year period. Twenty-three of these were isolated from stored blood and plasma, and thirty-one were isolated from cutaneous surfaces. The remainder were obtained from air, dust or soil. The organisms from these sources included the following:

Staphylococcus aureus (hemolytic and nonhemolytic).
Staphylococcus albus (hemolytic and nonhemolytic).
Staphylococcus citreus.
Micrococcus (several species).
Streptococcus (beta and alpha hemolytic types).
Pseudomonas aeruginosa.
Bacillus subtilis.
Bacillus cereus.
Bacillus mycoides.
Bacillus sp. (several unidentified species).
Vibrio sp. (unidentified; from the air).

Since it is not practicable to publish the results on all these organisms, the data presented are representative of the type of result obtained on organisms isolated from accidentally contaminated stored plasma or blood. In the tables are recorded the results of periodic enumeration of the bacterial population in various concentrations of the drugs.

SIGNIFICANCE OF EXPERIMENTAL RESULTS

Since only a small portion of my data are reproduced, supplementary comments are necessary in order to present all my evidence. The tables demonstrate the results on the sterilizing effect of the different drugs used. In most instances this was accomplished in three days at room temperature. A longer period was required for the same results to be achieved at refrigerator temperature. Therefore, maintaining contaminated plasma at room temperature for several days would actually be a useful procedure if one of the sulfonamide compounds was added. It is also apparent from table 1 that larger amounts of the drugs are necessary for longer periods of storage when the plasma is maintained at refrigerator temperatures. This is due partly to the decreased activity of the compound and partly to the preservative action of the low temperature on the bacteria.

TABLE 2.—*Organism Pseudomonas Aeruginosa (Pyocyaneus)*

Days	Control	Sulfanilamide 0.02%	Sulfanilamide 0.05%	Sulfanilamide 0.1%	Sodium Sulfapyridine 0.02%	Sodium Sulfapyridine 0.05%	Sodium Sulfapyridine 0.1%	Sodium Sulfathiazole 0.02%	Sodium Sulfathiazole 0.05%	Sodium Sulfathiazole 0.1%
Storage at Room Temperature (20-24 C.)										
0	14,720	16,880	16,000	14,080	11,520	10,240	10,880	12,200	12,880	12,140
3	10^6+	0	0	0	0	0	0	0	0	0
10	10^6+	0	0	0	0	0	0	0	0	0
30	10^6+	0	0	0	0	0	0	0	0	0
55	10^6+	0	0	0	0	0	0	0	0	0
Storage in Refrigerator (4-6 C.)										
0	7,080	6,400	5,000	6,410	8,320	12,800	9,600	12,800	9,600	5,120
3	4,480	7,040	3,840	2,840	5,120	3,840	3,322	6,400	6,000	6,400
10	2,000	3,440	2,000	2,840	3,800	5,480	5,920	5,720	1,920	2,080
30	280	70	140	250	110	140	180	60	0	0
55	40	0	0	0	0	0	0	0	0	0

In exceptional cases, control tubes became sterile owing to the bactericidal action of the plasma itself. This occurred in refrigerated specimens as well as in those maintained at room temperature.

The data show that no one compound is preferable, since the end results are the same. Preliminary results with sulfadiazine indicate that they will parallel those presented herein. They are not included because the period of storage has not been sufficiently protracted.

3. Novak, Milan: Use of Bacteriostatic Drugs in Preservation of Blood for Transfusion, Proc. Soc. Exper. Biol. & Med. 41: 210 (May) 1939.

4. Report of the Blood Transfusion Association Concerning the Project for Supplying Blood Plasma to England, Jan. 31, 1941; Blood Transfusion Association, 2 East 103d Street, New York. Strumia and McGraw.[5]

In the results obtained on one hundred and fourteen strains of bacteria I encountered four which grew in a 0.1 per cent concentration of the compounds. These strains were originally isolated about two years previously from contaminated stored blood and plasma. At the time of isolation they were able to grow at

TABLE 3.—*Organism Staphylococcus Albus*

Days	Control	Sulfanilamide 0.02%	Sulfanilamide 0.05%	Sulfanilamide 0.1%	Sodium Sulfapyridine 0.02%	Sodium Sulfapyridine 0.05%	Sodium Sulfapyridine 0.1%	Sodium Sulfathiazole 0.02%	Sodium Sulfathiazole 0.05%	Sodium Sulfathiazole 0.1%
Storage at Room Temperature (20-24 C.)*										
0.....	20	10	50	20	10	40	20	20	40	20
3.....	20	20	20	60	40	60	50	20	20	20
20.....	10^8+	0	0	0	10	0	0	0	10	0
30.....	10^8+	0	0	0	0	0	0	0	0	0
100.....	10^8+	0	0	0	0	0	0	0	0	0

* Would not grow in controls at refrigerator temperature.

TABLE 4.—*Organism Bacillus Mycoides*

Days	Control	Sulfanilamide 0.02%	Sulfanilamide 0.05%	Sulfanilamide 0.1%	Sodium Sulfapyridine 0.02%	Sodium Sulfapyridine 0.05%	Sodium Sulfapyridine 0.1%	Sodium Sulfathiazole 0.02%	Sodium Sulfathiazole 0.05%	Sodium Sulfathiazole 0.1%
Storage at Room Temperature (20-24 C.)*										
0.....	60	30	60	60	40	30	50	60	50	70
3.....	40	0	0	0	0	0	0	0	0	0
10.....	10^8+	0	0	0	0	0	0	0	0	0
30.....	10^8+	0	0	0	0	0	0	0	0	0
120.....	10^8+	0	0	0	0	0	0	0	0	0

* Would not grow in controls at refrigerator temperature.

refrigerator temperatures and were completely inhibited in freshly drawn citrated human blood by 0.02 per cent sulfanilamide at 4 to 6 C. In the interim they were maintained on peptone mediums, acquired an unusual resistance to the bacteriostatic action of the sulfonamide derivatives and lost their ability to grow at refrigerator temperatures. It was found that 0.2 per cent of the sulfonamide derivatives was sufficient to bring about sterilization of plasma inoculated with these strains. It is deemed advisable, therefore, to use 0.2 per cent of the drugs routinely so as to insure complete safety, though it is not known whether similarly resistant strains ever occur as contaminants from the usual sources.

In an original publication [5] on the use of sulfanilamide for insuring sterility of stored whole blood a 0.02 per cent quantity was recommended for routine use. Hunwicke [6] has essentially confirmed these results. Since fresh blood contains active phagocytes, complement and bactericidal substances which reinforce the action of the sulfonamide derivative, only a small amount of the latter is required. In plasma larger quantities (0.2 per cent) of the sulfonamide compounds are necessary in the absence of the other antibacterial substances and because of the longer period of storage.

PRACTICAL APPLICATION OF THE METHOD

In actual use it is most convenient to draw blood from the donor directly into a solution containing both sodium citrate and the sulfonamide derivative. The antibacterial effect is thus obtained from the very moment the blood is removed from the donor's vein. For routine work it is advisable to use sodium sulfathiazole.

The solution consists of 1.5 Gm. of sodium citrate and 1 Gm. of sodium sulfathiazole sesquihydrate in 50 cc. of physiologic solution of sodium chloride. The solution is autoclaved in the regular flask into which blood is to be drawn. This amount of the sulfonamide drug makes a final concentration of 0.2 per cent when 450 cc. of blood is added. The plasma may then be separated by centrifugation or sedimentation. Whenever tests for sterility are desired they should be made with mediums containing para-amino benzoic acid to neutralize the bacteriostatic action of sulfathiazole, as suggested by Janeway and Shwachman.[7]

SUMMARY

The many advantages in the general use of plasma stored in the fluid state have been overshadowed by numerous reports of bacterial contamination. Another less important objection is the gradual deterioration of prothrombin, fibrinogen and complement. The dangers of contamination by bacteria can be completely eliminated by the addition of 0.2 per cent of sodium sulfathiazole. The objections raised on the basis of deterioration of certain elements are not pertinent, since they are not essential in the instances in which plasma transfusions are ordinarily instituted. In cases of shock, burns, hypoproteinemia and cerebral edema, the elements which deteriorate in stored plasma are of no import. In the majority of instances it is in these conditions that stored plasma is administered, so that the emphasis placed on the deterioration of these elements is not justified from the practical standpoint. In cases of shock with severe hemorrhage, of blood dyscrasias with hemorrhagic tendencies or of infections, the use of fresh blood and plasma rather than stored plasma is most advisable, since erythrocytes as well as the other components are essential to the therapy.[8]

Bacterial contamination, therefore, is the only important problem involved in the storage of fluid plasma. It is my opinion that sulfonamide derivatives, which exert their antibacterial effect under all conditions of processing and storage, make it possible for hospitals and others to rely on the safety and immediate availability of stored liquid plasma. The relatively expensive and elaborate methods for processing this essential material are therefore unnecessary in most instances, as Strumia and McGraw [9] have already indicated.

CONCLUSIONS

1. Bacterial contamination is the only serious objection to storing plasma in the fluid state.

2. The addition of 0.2 per cent of a sulfonamide derivative, preferably sodium sulfathiazole, in plasma completely eliminates the problem of bacterial contamination, since it actually sterilizes minimally contaminated specimens of plasma regardless of the organism or the temperature involved (4 C. to 24 C.).

3. Plasma preserved with sodium sulfathiazole is safe, immediately available, economical and simple to use.

4. Elaborate and expensive methods for routine processing of plasma are unnecessary in most hospitals.

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5. Novak, Milan: Preservation of Stored Blood with Sulfanilamide, J. A. M. A. **113**:2227 (Dec. 16) 1939.

6. Hunwicke, R. F.: Sulfanilamide as a Preservative in Stored Blood, Brit. M. J. **2**:380 (Sept. 21) 1940.

7. Janeway, C. A., and Shwachman, Anne: Method for Obtaining Rapid Bacterial Growth in Cultures from Patients Under Treatment with Sulfonamides, J. A. M. A. **116**:941 (March 8) 1941.

8. Ziegler, E. R.; Osterberg, A. E., and Havig, M.: The Prothrombin Changes in Banked Blood, J. A. M. A. **114**:1341 (April 6) 1940. Quick, A. J.: The Prothrombin in Preserved Blood, ibid. **114**:1342 (April 6) 1940.

9. Strumia, M. M., and McGraw, J. J.: Frozen and Dried Plasma for Civil and Military Use, J. A. M. A. **116**:2378 (May 24) 1941.

TREATMENT OF GANGLION BY INJECTION OF CAROID A DANGEROUS PROCEDURE

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In December 1940 a new treatment of ganglion by the injection of a proteolytic enzyme (caroid) was described.[1] The method is as follows:

A suspension of pulverized enzyme in the ratio of 1 drachm of enzyme to each 5 cc. of water is prepared, and 1 minim of hydrochloric acid is added to 10 cc. of suspension. This is shaken vigorously and drawn into a 10 cc. syringe fitted with a 20 gage needle. The needle is inserted and the suspension is injected into the ganglion slowly. Usually 2 cc. is sufficient. In thirty minutes the liquefaction is completed, but the solution may be allowed to remain twenty-four hours without causing any distress and the patient may return the following day for aspiration. The ganglion may then be aspirated freely and the collapsed cyst irrigated with distilled water without removal of the needle. A light pressure dressing is applied.

I have under my care a patient who was treated in this manner and the result is a surgical tragedy. The report of this case is as follows:

REPORT OF CASE

On the evening of Aug. 8, 1941 a woman aged 22 consulted her physician on account of a ganglion on the dorsum of the right wrist which had been present for about four years. Two cc. of the suspension of caroid, as described, was injected into the ganglion. This was followed by immediate severe pain. The pain was excruciating, and efforts to withdraw the material by means of the needle were not successful. Consequently, about half an hour later under aseptic conditions a small stab incision was made into the ganglion and the material was expressed. The patient was sent home with a dry dressing applied to the wrist and given sedation. The next day the

Fig. 1.—The wrist and hand seven days after the injection of caroid. The necrotic skin and subcutaneous tissue have been excised and the hand is moderately swollen. The margins of the wound are undermined.

wrist and forearm were red, hot and swollen, the patient felt sick and the temperature was elevated. The swelling increased rapidly and on the evening of the second day, about forty hours after the original injection, the patient was admitted to the Barnes Hospital.

From the Department of Surgery of the Washington University School of Medicine.

1. Ball, E. J.: A New Treatment of Ganglion, Am. J. Surg. 50: 722-723 (Dec.) 1940.

On admission the temperature was 38 C. (100.4 F.) and the pulse was 100 and the patient appeared to be moderately sick. The physical examination was negative with the exception of the right upper extremity, which was much swollen, moderately red and extremely tense, especially over the upper portion of the forearm and around the elbow. The redness and swelling extended up to the shoulder. On the dorsum of the wrist there was a small incision about ½ inch long from which a small amount of thin purulent material could be expressed. Extending downward from this onto the dorsum

Fig. 2.—The forearm, wrist and hand eighteen days after the injection of caroid, showing the undermining of the skin by the necrosis of the subcutaneous tissues.

of the hand was an area of necrosis of the skin which was about 1 inch wide and 3 inches long. The swelling and redness extended up to the shoulder. The arm was so tense that gas bacillus infection was considered. However, there was no odor from the pus, no gas bubbles were expressed from the wound and smears showed a few slender bacilli and a few cocci. Consequently the entire upper extremity was immobilized in a massive hot wet dressing and elevated on two pillows. The patient was given 2 Gm. of sulfathiazole on admission and was given 1 Gm. every four hours afterward.

Laboratory examination showed the urine to be normal, the white blood cell count was 29,950, the differential count was stabs 17 per cent, segmented cells 76 per cent, lymphocytes 12 per cent and monocytes 4 per cent, the red blood cell count was 3,110,000 and hemoglobin was 62 per cent.

On the following morning the swelling and redness had extended above the shoulder and for a moderate distance onto the chest wall. The tenseness and pain in the arm were about the same as on admission. Consequently, under local anesthesia the incision on the dorsum of the wrist was extended upward for a distance of about 2 inches. The area of necrosis on the dorsum of the hand was also incised. After the incision through the skin had been made it was found that the subcutaneous tissues presented a peculiar grayish white gelatinous appearance. Apparently there was widespread necrosis of the subcutaneous tissues, the necrosis extending beyond the limits of the incision, but it was felt that the incision would afford ample drainage. Three Gm. of sulfanilamide was placed in the wound. The hot wet dressing and the sulfathiazole were continued (fig. 1). At this time the temperature was 38.8 C. (101.8 F.) and the pulse was 120. A blood culture which had been taken on admission showed no growth. That afternoon the patient was transfused, 500 cc. of citrated blood being given.

Culture of the wound on the day after admission and also ten days later revealed colon bacilli, bacilli of the subtilis group and Staphylococcus albus. No streptococci were found, but the patient entered on Sunday afternoon and the cultures were not made until she had had 5 Gm. of sulfathiazole by mouth.

After the incision and drainage with the continued use of 1 Gm. of sulfathiazole every four hours the patient's general condition improved. The temperature ranged from 37 to 39.2 C. (98.6 to 102.6 F.) until August 17, when it dropped to normal and there was no significant rise in temperature

after that date. The swelling and redness in the upper arm subsided gradually, but the region of the elbow remained swollen and red and tender. Consequently, on August 15 the elbow was aspirated and it was found that most of the swelling was in the subcutaneous tissues, only a few cubic centimeters of serosanguineous fluid being obtained. Cultures of this yielded no growth.

The improvement continued, but there was persistent swelling and tenderness over the dorsum of the forearm and on August 21 a probe was introduced beneath the skin and it was found that there was a cavity extending up almost to the elbow. Under local anesthesia the skin over this cavity was incised and the skin edges were folded back. It was found at this time that the grayish white necrosis of the subcutaneous tissue extended well over the dorsum of the forearm and almost up to the elbow (fig. 2). The wound was dressed with sulfanilamide powder every other day.

In the meantime the extensive area of necrosis on the dorsum of the hand had been excised with a knife. Under it was found a similar gray necrosis of the subcutaneous tissue. The necrosis of the subcutaneous tissue extended beyond that of the skin, so that it involved the tissues on either side to the border of the hand and down to the knuckles. The veins were thrombosed and necrosed. Apparently the necrosis did not extend through the tendon sheaths, nor did it involve the wrist joint. This is partly accounted for by the fact that from the time the patient was admitted to the hospital the hand and wrist were immobilized, first in a large wet dressing, then on a splint and finally in a plaster of paris mold.

On August 17 the patient had urticaria and complained of a sore throat, and on examination the tongue and pharynx were bright red. This was believed to be due to the sulfathiazole, which she was still taking. The sulfathiazole was discontinued, and the urticaria and sore throat cleared up promptly. The wet dressings were discontinued on August 14.

After the incision of the skin over the extensive subcutaneous abscess the wound was dressed daily with sulfathiazole powder and the necrotic tissue was excised or separated. The infection subsided and the convalescence was uneventful.

On September 25 Dr. J. B. Brown operated on the patient and drew the skin together over the forearm and sutured this part of the wound, while that part over the wrist and dorsum of the hand from which the skin and subcutaneous tissue had been lost by necrosis was covered with a split skin graft. This was of necessity applied directly over the sheaths of the extensor tendons. The graft was successful and the patient left the hospital on October 4, fifty-seven days after admission.

At present (Oct. 28, 1941) there is marked disability of the hand, as the fingers are quite stiff and the extensor tendons are adherent to the adjacent tissues.

COMMENT [2]

This case is reported because it is felt that the medical profession should be warned against the injection of material which is not known to be sterile. I believe that we are apt to forget sometimes how dangerous this can be. It is bad enough to place unsterile material in an open wound, but it is much more dangerous to inject it into the tissues. It is believed that the widespread necrosis was partly chemical from the enzyme and partly due to the bacteria which it contained.

Cultures of the caroid which was used in this instance were made and the material was found to be heavily contaminated with Escherichia coli, Bacillus subtilis, nonhemolytic streptococci and Staphylococcus albus. Two other samples of the material were obtained elsewhere and were cultured and, strangely enough, these also were heavily contaminated with the same four organisms.

I have written to the American Ferment Company and in its reply it implies that sterilization is not necessary if the injection is properly and carefully done. This, of course, is an error, as, if the material contains pathogenic organisms, it does not make any difference how the injection is made. One is still implanting pathogenic organisms into the tissues. The firm states that "where the physician desires to employ a sterilized solution" the caroid powder can be sterilized by heating it for twenty to thirty minutes to the temperature of boiling water. Apparently, dry heat is recommended and the firm advises making fresh suspensions in sterile water just before using. It is my impression that this is not adequate sterilization for material which is to be injected and which may or may not contain spore-bearing bacteria. If this material can be sterilized without destroying the enzyme, this should be done before it is sold for injection or implantation in wounds. If it cannot be sterilized completely without destroying the enzyme, it should not be sold for injection or implantation in wounds.

2. Caroid, the preparation of papain (the active principle from the fruit of Carica papaya), originally marketed by the American Ferment Company for oral use as a digestive ferment, was rejected by the Council on Pharmacy and Chemistry in 1914 after extensive consideration (Caroid and Essence of Caroid Refused Recognition, Annual Reprint of the Reports of the Council on Pharmacy and Chemistry, 1914, p. 109) because the digestive activity of the product on proteins was found to be low and variable by the methods of testing employed at that time.

STUDIES ON LYMPHOGRANULOMA VENEREUM INFECTION OF THE RECTUM

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AND
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The purpose of this paper is to call attention to the frequency of lymphogranuloma venereum infection of the rectum, to emphasize the rather characteristic clinical and diagnostic features and to comment on the therapeutic value of sulfanilamide and its derivatives.

Lymphogranuloma venereum typically is a subacute, or rather a chronic, venereal disease [1] characterized primarily by the bubo. Spontaneous recovery may occur, or the disease may lapse into a chronic indolent state. The course may be acute, almost typhoidal in character, and, particularly in extragenital infections, its true nature may not be suspected. Generalized

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1. Articles on lymphogranuloma venereum:
Stannus, H. S.: A Sixth Venereal Disease, London, Baillière, Tindall & Cox, 1933.
Pierrol, G. M.; Rome, H. P., and Jones, C. A.: Lymphogranuloma Venereum: A Systemic Disease, Tr. A. Am. Physicians 53:275, 1938.
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Melczer, M.; Sipos, K., and Venkei-Wlaccise, T.: A Fatal Case of Generalized Lymphogranuloma Venereum, Orvosi hetil. 83:6 (Jan. 7) 1939.
Cannon, A. B.: Cutaneous and Systemic Manifestations of Lymphogranuloma Venereum and Its Differential Diagnosis, J. Connecticut M. Soc. 3:329 (July) 1939.

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manifestations, such as fever and multiple arthritis, may be present. There is evidence of the occurrence of a subclinical form. For instance, the husband of our patient E. S. (case 1) has no clinical evidence of disease, gives no history suggestive of such infection and yet has been found, on the two occasions on which he has been tested, to give a strongly positive Frei reaction. His blood serum has been shown to possess neutralizing properties against the virus.[2]

The great frequency of lymphogranuloma venereum is not generally appreciated. De Wolf and Van Cleve [3] in 1932 in a group of 1,010 patients hospitalized for various disorders found 58 (5.7 per cent) who gave a definitely positive Frei reaction. All of these gave a definite history of lymphogranuloma venereum. Gray and his associates [4] in 1936, working in a city venereal disease clinic, obtained a positive Frei reaction in 3.4 per cent of the white and in 40 per cent of the Negro patients. Many of these did not give a positive history. In spite of the latter figure it is clear that the disease is no respecter of race or, indeed, of sex or age. Statistics vary as to the number of cases in which rectal involvement occurs, but D'Aunoy and von Haam [5] considered the inflammatory stricture of the rectum to be "without doubt the most serious manifestation of venereal lymphogranuloma."

The rectal infection of lymphogranuloma venereum is extremely chronic and persistent. The statement has been made that while no patient dies from this disease all do, in time, die with it. The inflammation usually leads to the formation of a stricture which may produce complete obstruction. In a series of 76 patients with chronic inflammatory disease of the rectum, the rectosigmoid or the colon seen by us, 10 (13 per cent) were found to have lymphogranuloma venereum. All these patients were white, 7 were female and 3 were male.

In the female, rectal involvement apparently occurs usually as a direct extension of the disease by way of the lymphatic vessels from the vagina to the rectum. We have not been able to elicit a history of coitus per rectum from our female patients, although this has been reported by other investigators. One of our male patients, however, who had never experienced the heterosexual relationship had frequently practiced pederasty. This is in accord with the view that rectal involvement in the male is frequently due to direct infection.[6]

The outstanding symptom of the disease is rectal bleeding, usually small in amount but recurring daily for months and years. Occasionally the bleeding is rather copious. There is little or no pain until the development of stricture, when abdominal cramps and tenesmus are likely to appear. A seropurulent rectal discharge may be present. Perianal or perirectal abscesses with fistula formation constitute frequent complications.

TABLE 1.—*Lymphogranuloma Venereum Infection of the Rectum in Ten White Patients* *

Name	Sex	Age	History of Buboes	Lesion	Frei Reaction, Mm.	Neutralizing Power of Serum	Isolation of Virus: Source of Biopsy Specimen	Isolation of Virus: Result
1. E. S.	♀	40	Positive	Reddened granular mucosa; stricture 4.5 cm. above anus	10 8	Strongly positive	Ulcerated mucosa below stricture... Same, 5 mo. later.....	Negative Positive
2. L. P.	♂	40	.....	Friable, bleeding mucosa; colostomy; rectal stricture	12	Positive	Lower margin of stricture.....	Negative
3. E. P.	♀	38	Positive	No inflammation; smooth stricture 6.5 cm. above anus	12 9	Very strongly positive	Lower margin of stricture.....	Positive
4. L. C.	♀	33	Positive	Inflamed, bleeding, polypoid mucosa; stenosis of anus	12	Strongly positive	Polypoid area of mucosa.....	Positive
5. G. H.	♀	36	Positive	Stricture 5 cm. above anus; mucosa below chronically inflamed	11	Strongly positive	Lower margin of stricture..... Same, 2½ mo. later.....	Negative Positive
6. M. G.	♀	28	Positive	Granular, bleeding mucosa; mucopurulent exudate; no stricture	7 5	Strongly positive	Rectal mucosa ..... Same, 3 mo. later..... Same, 4 mo. later.....	Negative Negative Negative
7. F. B.	♂	39	Negative	Numerous superficial ulcerations with bleeding; no stricture	8	Positive	Rectal mucosa	Negative
8. B. S.†	♀	49	Negative	Granular, bleeding mucosa; no stricture	8	Positive	Rectal mucosa	Negative
9. C. C.	♂	41	Negative	Inflamed, friable, edematous bleeding mucosa; profuse purulent exudate; no stricture	7 7 7	Positive	Rectal mucosa	Positive
10. P. H.	♀	30	Negative	Bleeding mucosa; benign polyps; stricture 8 cm. above anus; colostomy	0‡ 7	Positive Positive	Mucosa below stricture..... Same, 13 mo. later.....	Negative Unsatisfactory

* The cases of E. S., L. P., E. P., M. G., F. B. and P. H. have been described in considerable detail in a previous publication (Rodaniche, Enid C.; Kirsner, J. B., and Palmer, W. L.: Lymphogranuloma Venereum in Relation to Chronic Ulcerative Colitis, J. A. M. A. 115:515-519 [Aug. 17] 1940). Further information regarding E. S. is included with the case reports appended to this article.
† Died; see text and case summary.
‡ Commercial antigen.

Stricture formation is probably a rather late phase of the disease, and yet the diagnosis is rarely made before the stricture develops. It was present in 6 of our 10 cases (table 1). Although the date of the primary infection is usually unknown, the slow development of the lesion is indicated by the fact that the rectal symptoms may develop months or years after the appearance of buboes. The course of the disease is extremely chronic. We have succeeded in demonstrating the presence of virus in the rectal mucosa six, eight, thirteen and twenty-one years after the onset of symptoms. Case 1 illustrates these features beautifully. An interval of ten years elapsed between the development of the bubo and the appearance of rectal bleeding. During a second interval, of eleven years, bleeding continued and the rectal stricture remained essentially unchanged. The virus was then isolated from the rectal mucosa, twenty-one years after the original bubo. The persistence throughout this twenty-one year period of a stubborn and moderately severe "rheumatoid arthritis" is of interest.

Lymphogranuloma venereum often produces an almost pathognomonic type of rectal stricture. It has been

2. Rodaniche, Enid C.: The Neutralization Test in Lymphogranuloma Venereum, J. Infect. Dis. 66:144-147 (March-April) 1940.
3. De Wolf, H. F., and Van Cleve, J. V.: Lymphogranuloma Inguinale, J. A. M. A. 99:1065-1071 (Sept. 24) 1932.
4. Gray, S. H.; Hunt, G. A.; Wheeler, Paul, and Blache, J. O.: Lymphogranuloma Inguinale: Its Incidence in St. Louis, J. A. M. A. 106:919 (March 14) 1936.
5. D'Aunoy, Rigney, and von Haam, Emmerich: Venereal Lymphogranuloma, Arch. Path. 27:1032-1082 (June) 1939.
6. Coutts, W. E.; Opazo, Luis, and Montenegro, Martha: Digestive Tract Infection by the Virus of Lymphogranuloma Inguinale, Am. J. Digest. Dis. 7:287, 1940.

recognized under various names in the medical literature for almost a hundred years, first as hyperplastic infiltration of the rectum and later, more appropriately, as inflammatory stricture of the rectum. The stricture is produced by an inflammatory and cicatricial infiltration of the entire circumference of the rectum. It is usually rubberlike in consistency; the examining finger fits into it snugly, as into a tight glove. The mucous membrane covering the stricture is friable and edematous; ulceration, polyposis and fistulas may develop. Torpin, Pund and Sanderson,[7] after studying 145 cases of lymphogranuloma venereum, said: "All patients with rectal strictures not due to trauma of hemorrhoidectomy have had a positive Frei test." However, we have observed at least 3 cases of so-called nonspecific ulcerative colitis involving the entire colon with rectal or sigmoidal stricture. There was no history of lymphogranuloma venereum in any of these, the Frei reaction was negative and the serum did not contain neutralizing bodies for lymphogranuloma venereum. Szilagyi[8] noted a positive Frei reaction in 14 of 17 patients with rectal stricture, excluded 2 of the remaining 3 as unsatisfactorily examined and attributed the stricture in the third to syphilis because there was "a negative Frei reaction, a positive Kahn test and a positive rectal biopsy for lues. At autopsy the luetic etiology of the stricture was confirmed and other evidences of lues were found."

The stricture is located usually 3 to 8 cm. above the anus, although it may extend into the sigmoid flexure. In 1 of our patients (P. H.) there were two strictures, one in the rectum and one in the midportion of the sigmoid flexure. Another patient (L. P.) had been operated on elsewhere for a benign inflammatory stricture of the transverse colon. The pathologist had described the lesion in the resected specimen as "unusual." When the patient was seen by us some time later a rectal stricture was present and the Frei reaction was strongly positive. Rendich and Poppel[9] and other investigators have described similar cases.

The rectal mucosa in the 4 patients without stricture was friable, edematous and indistinguishable proctoscopically from that of patients with nonspecific ulcerative colitis. If the validity of the diagnosis under the foregoing circumstances is questioned, reference may be made to case 5 (C. C., table 1), in which there was no history of buboes and no stricture; pederasty had been practiced; the Frei intracutaneous test gave a positive result on three occasions; the patient's serum was shown to contain antibodies capable of neutralizing the lymphogranuloma venereum virus, and the presence of the virus in the rectal mucosa was demonstrated by animal inoculation.

The question arises as to whether lymphogranuloma venereum is capable of producing acute fulminating ulcerative colitis. In 1 of our 10 cases death occurred. It was not possible to decide whether the lesion of the colon was due to lymphogranuloma venereum, to nonspecific ulcerative colitis or to both diseases. The patient (B. S.) gave no history of buboes, had undergone hemorrhoidectomy for rectal bleeding eighteen months before death, had diarrhea a year later and died after an acute illness with fever and diarrhea of six months' duration. The distal two thirds of the colon was extensively ulcerated, the appearance being considered typical of nonspecific ulcerative colitis. It is unusual, however, in our experience for patients to die of ulcerative colitis without involvement of the entire colon. The Frei and the virus neutralization test had both given strongly positive results. An attempt to isolate the virus from a biopsy specimen of the mucosa was not successful, and unfortunately no further attempt was made at autopsy. To the best of our knowledge, no identical picture has been described in the literature on lymphogranuloma venereum, although Falconer[10] described a somewhat similar but also inconclusive case. The acute febrile course is well recognized. Furthermore, there is no reason to expect the infection to remain localized in the rectum. Indeed, definite evidence of involvement of other portions of the colon has been cited previously in this paper. Llombart and Mañeru[11] have described a patient with a positive Frei reaction, a rectal stricture and multiple strictures of the ileum attributed by them to lymphogranuloma venereum. The attempt, however, to relate regional ileitis in all cases to lymphogranuloma venereum has not been successful. In 4 cases of regional enteritis studied by us the Frei reaction has been negative and attempts to isolate the virus from the diseased tissue or from a neighboring lymph gland, obtained at operation, have been unsuccessful.

TABLE 2.—*Protection of Mice with Sulfanilamide and Sulfanilylguanidine Against the Lymphogranuloma Venereum Virus*

Drug in Diet	Number of Mice	Percentage		
		Typical Symptoms	Weight Loss	Mortality
1% sulfanilamide	20	0	11.2	0
1% sulfanilylguanidine	20	0	11.6	0
Control	20	100	28.1	50

The diagnosis of the genitoanorectal syndrome of lymphogranuloma venereum is simple if the possibility is kept in mind. Unfortunately, there exists an impression that it is to be found only in persons plying the oldest of all professions and in persons having intercourse with them. As a matter of fact, lymphogranuloma venereum, like all other venereal diseases, is fairly widely disseminated throughout the United States and, indeed, throughout the world. The most characteristic lesion, of course, is the unilateral or bilateral suppurating or nonsuppurating inguinal adenopathy, the bubo. The bubo is almost pathognomonic of lymphogranuloma venereum. Consequently the history of such a lesion or the residual scar is presumptive evidence of the disease. In our 10 cases, such a history was present in 6 and absent in 4 (table 1). A history of buboes is thus seen to be important but not essential. Esthiomene or genital elephantiasis, while not occurring in our series, would render the diagnosis self evident.

In our series the Frei reaction has been uniformly, consistently and persistently positive. We have used a mouse brain antigen prepared by one of us (E. C. R.) according to the usual technic from a strain of the virus isolated from pus aspirated from the enlarged inguinal node of a patient in the third week of the infection. Control tests have been performed regularly to exclude

7. Torpin, Richard; Pund, E. R., and Sanderson, E. S.: Lymphogranuloma Venereum in the Female, Am. J. Surg. **43**:688, 1939.
8. Szilagyi, D. E.: The Etiology of "Inflammatory" Rectal Stricture, Univ. Hosp. Bull. Ann Arbor **4**:12 (Feb.) 1938.
9. Rendich, R. A., and Poppel, M. H.: Lymphogranuloma Venereum of the Colon, Radiology **33**:472 (Oct.) 1939.
10. Falconer, Bertil: Colite spécifique comme maladie subsequente de la lymphogranulomatose inguinale, Acta dermat. vén. **19**:185 (May) 1938.
11. Llombart, A., and Mañeru, J.: Sur la localization de la maladie de Nicolas-Favre sur l'intestin grêle: Stenoses iléales multiples, Ann. d'anat. path. **16**:597 (May) 1939.

sensitivity to mouse brain without virus. In some cases tests have also been made with human antigen and with chick embryo antigen (lygranum).[12] The validity of the positive Frei reaction has been confirmed in all our 10 cases by a positive virus neutralization reaction and in 5 by isolation of the virus itself. In no instance

TABLE 3.—*Summary of E. S.'s Case History*

Date	Therapy	Frei Reaction	Virus Isolation	Rectum
1919 (bubo)				
1929-1930	.....	..	..	Bleeding and stricture continuously present
1937	.....	+		
May 1939	.....	+		
June 6, 1939	.....	..	0	
Nov. 30, 1939	.....	..	+	
Nov. 30-39	Sulfanilamide, 6 Gm. daily	..	..	Cessation of bleeding
Dec. 24-Dec. 2	Azosulfamide, 3.3 Gm. daily			
Nov. 1939-Mar. 1940	.....	..	..	Gradual subsidence of inflammation; 1 or 2 formed stools daily; no bleeding
March 1940 (conception)				
April 1940	.....	+		
July 1940	.....	..	..	Mild inflammation of rectal mucosa; stricture still present
Dec. 1940 (delivery; infant's Frei reaction negative)				
May 1941	.....	+ (Lygranum)	0	No recurrence of bleeding; mucosa normal; slight atrophic stricture

have we been confronted with a definitely positive Frei reaction without confirmatory evidence, such as a positive virus neutralization reaction. Furthermore, the validity of 66 negative Frei reactions has been substantiated by negative virus neutralization reactions.

In 1 of our 10 patients (M. G.) the cutaneous reactions, with both the mouse and the human antigen, were marginal in size, measuring respectively 7 and 5 mm. in diameter. The validity of the test was proved, however, by the demonstration in the serum of a strong neutralizing property for the virus. Pseudoreactions, consisting of allergic responses to mouse brain protein, have been eliminated by repetition of the test with human or chick embryo antigen. In addition to the 66 patients with nonspecific ulcerative colitis previously mentioned as having a negative Frei reaction we have studied a control group of 40 patients with diverse disorders such as peptic ulcer or carcinoma. All had a negative Frei reaction. We have come, therefore, to regard the Frei reaction as highly specific.

The virus neutralization test, previously described by one of us (E. C. R.),[2] is reliable but not as simple to perform or as inexpensive as the Frei test.

The most conclusive diagnostic procedure is the isolation of the virus from biopsy specimens of the rectal mucosa. The bits of tissue are well washed with sterile salt solution, macerated and suspended in salt solution, and the suspension is injected intracerebrally into mice. Typical symptoms occur in two to eight days. These consist of ruffling of the fur, arching of the back, tremors, ataxia, priapism, conjunctivitis, convulsions, cachexia and occasionally paralysis. Death ensues in about 50 per cent of the inoculated animals. The virus may be isolated from the brain; it may be transmitted from animal to animal, the virulence of the strain determined and the identity of the virus demonstrated by cross immunization experiments. These procedures are obviously more laborious than the Frei test, and negative results are less significant. However, in our series the virus was isolated before treatment in five of seven attempts in 5 cases. The identity of the five different strains of the virus thus obtained was established by cross immunization experiments.[13] As a further control, eight attempts were made to isolate the virus from the rectal mucosa obtained for biopsy from 7 patients with nonspecific ulcerative colitis who had a negative Frei reaction. These were uniformly unsuccessful.

The differential diagnosis of lymphogranuloma venereum infection of the rectum is thus not difficult. The stricture itself is a characteristic lesion not readily confused with carcinoma. Other inflammatory conditions of the rectum, such as nonspecific ulcerative colitis, may lead to the formation of stricture, but the presence of a positive Frei reaction, with or without a history of buboes, is presumptive evidence that the rectal lesion is attributable to lymphogranuloma venereum. The coexistence of gonorrhea or syphilis or both should not confuse the issue. Gonorrheal proctitis does occur, but there is reason to doubt that gonorrhea ever invades the rectal tissue deeply enough to produce an "inflammatory stricture." The possibility of syphilitic proctitis must be considered, but this lesion appears to be rare. Indeed, in the light of our present knowledge of lymphogranuloma venereum, its very existence would be questioned if it were not for the case described by Szilagyi.[8]

TABLE 4.—*Summary of C. C.'s Case History*

Date	Therapy	Frei Reaction	Virus Isolation	Rectum
10/1/40	.....	+	..	Edematous, friable, bleeding, purulent discharge
10/22	.....	..	+	Unchanged
10/31 to 11/19	Sulfanilamide, 2.4 to 3.5 Gm. daily			
11/19	.....	..	0	Mucosa entirely normal
11/20-30	.....	+		
11/26	.....	..	..	Friable, bleeding; mucopurulent exudate
12/1-6	Sulfanilamide, retention enema daily, 2.4 Gm. in 250 cc. of water			
12/7-4/8	Sulfanilamide retention enema 3 times weekly			
1/7/41	Sulfanilamide retention enema 3 times weekly	..	..	Definitely better; slight bleeding; mucosa no longer friable
2/3	Sulfanilamide retention enema 3 times weekly	..	..	Almost normal; few scattered areas of bleeding, no exudate
3/4	Sulfanilamide retention enema 3 times weekly	+ (Lygranum)	..	Practically normal
4/1	Sulfanilamide retention enema 3 times weekly	..	0	Slightly granular; practically normal
4/8	Sulfanilamide discontinued			
4/29	.....	..	0	Several small bleeding areas but rectum practically normal

A complete discussion of the therapy of lymphogranuloma venereum is beyond the scope of this paper. However, we do wish to refer briefly to certain experimental studies and clinical observations bearing on the action of sulfanilamide and its derivatives. Numerous workers have described the successful treatment with

12. Grace, A. W.; Rake, Geoffrey, and Shaffer, M. F.: A New Material (Lygranum) for Performance of the Frei Test for Lymphogranuloma Venereum, Proc. Soc. Exper. Biol. & Med. 45:259-263 (Oct.) 1940.

13. Rodaniche, Enid C.: A Comparison of Seven Strains of the Virus of Lymphogranuloma Venereum, J. Infect. Dis. 69:138-140 (Sept.-Oct.) 1941.

these drugs of experimental meningoencephalitis produced in mice and of inguinal buboes produced in other animals by the lymphogranuloma venereum virus.[14] One of us (E. C. R.[15]) has found that mice may be protected completely from lethal doses injected intracerebrally by the administration of a diet containing 1 per cent sulfanilamide or 1 per cent sulfanilylguanidine (table 2). The control animals all showed typical meningoencephalitic symptoms, usually within ten days, and 50 per cent of them died within that period. The protected animals remained well during the ten days of drug therapy. A few of the animals treated with sulfanilamide had mild symptoms after the discontinuance of the drug, but all recovered. These animals were subsequently found, by reinoculation, to have developed a complete immunity to the virus. The mechanism of this immunity was studied by killing certain infected asymptomatic mice during a period of therapy and assaying the brain. The virus was recovered in high concentration in each instance, indicating, therefore, that although the chemotherapy had protected the animal from disease it had not accomplished an in vivo sterilization or an attenuation of the virus.

The foregoing experimental observations on the effect of sulfanilamide and its derivatives are in accord with our clinical experiences and, indeed, with those of other workers.[16]

In many respects the most interesting of our group is patient E. S. (table 3), from whose rectal mucosa the virus was recovered twenty-one years after the bubo and whose rectal disease is known to have been present for eleven years. To our surprise, the rectal inflammation subsided entirely and the stricture disappeared almost completely after (1) sulfanilamide and azosulfamide and (2) pregnancy, an event which in itself, occurring after twenty years of sterility, was somewhat surprising. The improvement appeared to have been initiated by the chemotherapy and to have been furthered enormously by the pregnancy.

In patient C. C. (table 4) the administration of sulfanilamide for twenty days seemed to produce a most striking transformation in the proctoscopic appearance. The disease process recurred, however, within a week after the discontinuance of the drug. The use of sulfanilamide retention enemas daily for six days followed by such enemas three times weekly for four months apparently resulted in complete healing of the proctitis. The disease has not recurred as yet after seven weeks.

In contrast to the first 2 patients, patient M. G., whose disease was of three years' duration and was unaccompanied by stricture formation, exhibited only slight improvement after the administration of 4 Gm. of sulfanilamide daily for two weeks and no improvement after receiving 3.3 Gm. of azosulfamide daily for twenty-seven days followed by 5.3 Gm. daily for fourteen days.

To another patient, G. R. (table 6), whose disease had been present for six years and had resulted in severe stricture formation, sulfanilylguanidine was administered almost continuously for more than two and one-half months in a dose of 10 Gm. daily. Improvement occurred slowly but nevertheless definitely. There was a gain in weight amounting to 11 pounds (5 Kg.). The rectal pain disappeared. The number of stools decreased from fifteen to thirty daily to two to eight daily. The bloody rectal discharge disappeared. The stricture remained about 4 mm. in diameter, but it seemed softer. The adjacent rectal wall became thin and pliable. The mucosa at the site of the stricture and below remained granular and bled easily. The bacterial count per gram of feces decreased from an average of 20 to 50 million organisms, predominantly gram-negative bacilli, to an average of 100 to 600 thousand, predominantly gram-positive cocci.

TABLE 6.—*Summary of G. R.'s Case History*

Date	Therapy	Frei Reaction	Virus Isolation	Rectum
11/19/40	.....	+	0	Chronic inflammation with stricture 5 cm. above anus
2/1/41	.....	..	+	Unchanged
3/4	.....	+ (Lygranum)	..	Unchanged
3/9-20	Sulfanilylguanidine, 10 Gm. daily			
3/18	.....	..	..	Little change
3/24	Sulfanilylguanidine, 10 Gm. daily resumed			
3/27	Sulfanilylguanidine, 10 Gm. daily continued	..	..	Unchanged
4/8	Sulfanilylguanidine, 10 Gm. daily, continued	+	0	Mucosa bleeding; stricture unchanged
4/22	Sulfanilylguanidine, 10 Gm. daily, continued	..	0	Less bleeding; slightly improved
5/6	Sulfanilylguanidine, 10 Gm. daily continued	..	0	Unchanged
5/13	Sulfanilylguanidine, 10 Gm. daily, continued	..	0	No bleeding; definitely better but stricture unchanged
6/2	Sulfanilylguanidine discontinued			

As yet we have not succeeded in isolating the virus of lymphogranuloma venereum from the rectal mucosa during or, indeed, after chemotherapy. The Frei reaction, however, has consistently remained positive, indicating presumably the persistence of the virus within the organism. Judging from the experimental and clinical evidence sulfanilamide and its derivatives are apparently unable to destroy all the virus in the body, but they do tend to inhibit its action in some unknown manner. It is not clear whether these drugs are merely virustatic or actually virucidal or whether some other mechanism is operative. Perhaps the complete destruction of the virus in vivo is prevented by its localization within the cell. Regardless of the mechanism of action, however, the therapeutic value of sulfanilamide and its derivatives seems definitely established.

CONCLUSIONS

1. Lymphogranuloma venereum is a common cause of proctitis and sigmoiditis, with or without stricture formation. Its course may be extremely chronic. The disease may simulate nonspecific ulcerative colitis.

2. The presence of lymphogranuloma venereum may be easily established by means of the Frei intracutaneous test provided the test is properly used and controlled.

3. Therapy with sulfanilamide and sulfanilylguanidine is of definite value, particularly in cases in which there is no stricture formation, but prolonged administration of the drugs may be necessary.

14. Levaditi, C.: Chemothérapie expérimentelle de lymphogranulomatose inguinale, Compt. rend. Soc. de biol. **129**: 490, 1938.

15. Rodaniche, Enid C.: Sulfanilylguanidine and Sulfanilamide in the Treatment of Lymphogranuloma Venereum Infections of Mice, J. Infect. Dis., to be published.

16. Shropshear, George: Sulfanilamide in the Treatment of Strictures of the Rectum Caused by Lymphogranuloma Venereum, Illinois M. J. **74**: 153-156 (Aug.) 1938.

REPORT OF CASES

Case 1.—E. S., a white woman born in 1900, was first seen by us in 1931. Her childhood had been normal, and she had been perfectly well until after her first marriage, in 1916. She had one child by this marriage, born in 1917. In 1918, when the baby was about a year old, she had a rather severe attack of "rheumatic fever." In 1918 or 1919 her husband left her. The patient had a rather profuse vaginal discharge at some time during this marriage and took daily douches for an indefinite period. She was unable to state whether the vaginal discharge appeared before the attack of "rheumatic fever." Although the discharge was sufficient to make the patient feel that she had contracted a venereal disease, a physician was not consulted. In time the discharge disappeared. In 1919 she had a swelling of the right inguinal lymph node, which was lanced by a physician.

The patient remarried in 1921. She denies having had sexual intercourse with any one other than her two husbands. The arthritis continued to cause her a good deal of trouble. In the course of time it involved nearly all her joints—fingers, elbows, shoulders, back, hips, knees and toes—without causing much deformity. The tonsils and the teeth were removed and various medications given without noticeable improvement. In 1930 she first noticed blood in the stool; this continued to appear until her admission to the hospital. Examination at this time disclosed a deep scar in the right inguinal region and a stricture of the rectum beginning just within the anus.

There was no significant change in the course of the arthritis or in the rectal stricture until November 1939. A biopsy of the rectal mucosa on June 6, 1939 failed to demonstrate the presence of the virus of lymphogranuloma venereum, but on November 10 the virus was successfully isolated. The repeated making of cultures and direct examinations of the stool during the nine years had shown no pathogenic parasites or bacteria except Bacterium necrophorum. On November 10 4 Gm. of sulfanilamide daily was prescribed, and medication was continued for ten days, when a rash appeared and the drug was discontinued. The patient reported that she felt "better than in a long time" and that the bleeding had ceased. Azosulfamide was then prescribed in doses of 3.3 Gm. daily, and medication was continued for eight days. The blood in the stools did not recur. Proctoscopic examinations during December 1939 and January and February 1940 revealed a gradual subsidence of the inflammation. By March 1940 the patient was having only one or two formed stools daily without blood. The Frei reaction continued to be strongly positive. At this time, nineteen years after her second marriage, the patient became pregnant. Her condition improved progressively, and there was no further bleeding from the bowel. In July 1940 examination revealed the stricture to be still present, with evidence of mild inflammation of the mucosa. The patient continued free of symptoms and on December 17 gave birth to a normal infant, whose Frei reaction was negative.

To May 1941 there has been no recurrence of the bleeding or of the arthritis, and the patient has remained well. Proctoscopic examination now discloses a thin, atrophic scar, with slight stricture formation about 2 cm. above the anus. The large proctoscope, 1.7 cm. in diameter, may be introduced without difficulty 22 cm. beyond the anus. The mucosa everywhere appears normal except for the scars mentioned. Two pieces of tissue were removed for biopsy in an unsuccessful attempt to demonstrate the presence of the virus. The patient attributes her recovery to the pregnancy, although the record suggests that it began with the administration of sulfanilamide and azosulfamide in November 1939. The Frei reaction is still strongly positive. The patient's husband, who gave a history of having had gonorrhea with complete recovery in 1916, before he met his wife, and who has never had buboes or any clinical symptoms suggestive of lymphogranuloma venereum, nevertheless gave a strongly positive Frei reaction on Nov. 30, 1940 and again on May 19, 1941.

Case 4.—L. C., a white woman aged 33, had swollen inguinal lymph nodes shortly after marriage, eight years before admission. These nodes suppurated and were lanced by a local physician; draining sinuses persisted for several weeks. A year later the stools suddenly became loose and watery, and they persisted so for two weeks; examination of the stools for parasites was said to have given negative results. The diarrhea recurred subsequently on numerous occasions, and blood and mucus were noted in the stools. It was said that six months before admission a rectal stricture had been dilated by a proctologist and that polyps had been removed from the rectum one month before admission. On physical examination the patient was seen to be severely emaciated. The anal region was reddened and excoriated; the anal ring was narrowed; the rectal mucosa appeared polypoid and inflamed. Examination of the stools for parasites, agglutination tests (typhoid, paratyphoid A and B, brucellosis) and two Wassermann and Kahn tests gave negative results. Bacterium necrophorum was absent from several stool cultures. Roentgenograms revealed active bilateral pulmonary tuberculosis and an extensive lesion involving the rectal ampulla, the nature of which was not determined. The Frei reaction was positive, and the lymphogranuloma venereum virus was obtained from a biopsy specimen of the rectal mucosa. Injection of tissue from the anal region into a guinea pig on three separate occasions revealed no evidence of tuberculosis. There was persistent secondary anemia. The value for total proteins was normal, but the albumin-globulin ratio was reversed. The patient was given sulfanilamide on the eighteenth hospital day in doses averaging about 5 Gm. daily, receiving a total of 68.7 Gm. in thirteen days. The level of free sulfanilamide in the blood rose to 10 mg. per hundred cubic centimeters. There was no definite clinical improvement, however, and the drug was withdrawn because of anorexia, cyanosis and a decrease in the red cell level. Subsequent therapy included several blood transfusions and the administration of sedatives, codeine and vitamins. The number of stools diminished from four to eight daily to two or three, and the inflammation of the rectal mucosa subsided. On the seventy-eighth hospital day the patient was given sulfanilylguanidine, 4.8 Gm.; this dose was used for six days, then 9.6 Gm. for three days, and then 2.4 Gm. for one day, a total of 60 Gm. in ten days. The level of free sulfanilylguanidine in the blood varied from 0.8 to 1.3 mg. and the level of total sulfanilylguanidine from 1.3 to 1.8 mg. per hundred cubic centimeters. The patient's condition remained unimproved, although the total bacterial count in the stool decreased.

Case 5.—G. R., a white woman aged 26, first noted the passage of blood and pus from the rectum six years before admission. Her appetite gradually had failed, resulting in a progressive loss of weight amounting to 66 pounds (29.9 Kg.). She had undergone two operations for a rectal fistula and had been told of the presence of a rectal stricture. It was learned that at the age of 15 the patient had contracted syphilis and had received antisyphilitic therapy for five years. Marriage had been contracted at the age of 16 and had been terminated at the age of 20, approximately coincident with the development of the rectal bleeding. The patient denied having had sexual intercourse during the six years after divorce.

Physical examination revealed that the patient was thin and obviously ill. There were generalized abdominal tenderness and enlargement of the inguinal lymph nodes. Just to the right of the fourchette was a hard, tender, nodular mass, 2 by 2 cm., in the center of which was a small opening; a broad linear scar was noted on the left side of the fourchette. Proctoscopic examination revealed a stricture 5 cm. from the anus; the rectal mucosa was roughened and granular and bled easily. The Frei reaction was positive; the virus was not obtained from a biopsy specimen of rectal tissue, but it was found at a second examination several months later. The Wassermann and Kahn reactions were negative; the stools at first showed no parasites but later were observed to contain Strongyloides stercoralis. Bacterium necrophorum was not isolated from stool cultures. Routine agglutination tests gave negative results. There was moderate secondary anemia. Roentgen examination revealed a uniform narrowing and ulceration of the rectum and of the rectosigmoid portion of the colon, with dilatation of the bowel above this narrowing. Roentgenograms of the chest disclosed bilateral fibrocalcific pulmonary tuberculosis. Therapy included the use of a bland diet, sedatives, codeine,

ferrous sulfate, vitamins and a blood transfusion. The clinical condition was not greatly altered. The stools continued to be liquid and contained blood. The patient's temperature at first fluctuated between 98.6 and 100.5 F., gradually rose to 103 F. and then subsided to the previous level. Sulfanilylguanidine therapy was started on the seventh hospital day with a dose of 10 Gm. daily, the patient receiving a total of 106 Gm. in eleven days. The drug was withdrawn for four days because of a localized cutaneous rash; therapy was then resumed for sixty-nine days. The total intake was 800 Gm. The level of free sulfanilylguanidine in the blood gradually rose from 1.5 to 6.8 mg. and the level of total sulfanilylguanidine from 2.1 to 8 mg. per hundred cubic centimeters. There was a decided decrease in the total bacterial count of the stools but not a sterilization.

Improvement occurred slowly but nevertheless definitely. There has been a gain in weight amounting to 11 pounds (5 Kg.). The rectal pain has disappeared. The number of stools has decreased from fifteen to thirty daily to two to eight. The bloody rectal discharge has disappeared. The stricture remains about 4 mm. in diameter, but it seems softer. The adjacent rectal wall is now thin and pliable. The mucosa at the site of the stricture and below it is still granular and bleeds easily. There have been no toxic manifestations from the sulfanilylguanidine therapy, and the red blood count has varied from 4.5 to 5.1 million. Two Frei tests (one with lygranum and one with mouse antigen) during the course of treatment gave positive results. Virus studies were made on two occasions during this period, two and three bits of rectal tissue being removed each time, with negative results.

CASE 8.—B. S., a white woman aged 49, had undergone a hemorrhoidectomy one year and a half previously because of rectal bleeding. Six months prior to her initial visit at the University of Chicago Clinics she had begun to have diarrhea, with blood and mucus in the stools. Proctoscopic examination revealed that the rectal mucosa was granular and bleeding. Laboratory studies, including agglutination tests, examination of the stools for parasites and Wassermann and Kahn tests gave negative results. The Frei reaction was positive, but the virus could not be isolated from a biopsy specimen of the rectal mucosa. The patient's condition did not improve on treatment which included the use of a bland diet, sedatives and cod liver oil retention enemas, and she was admitted to the hospital. Her condition grew progressively worse. The diarrhea, producing numerous watery stools giving a strongly positive chemical reaction for blood, increased. The patient's temperature at first varied from 99 to 102.5 F., gradually rose to 104 F. and by the twenty-first hospital day had increased to 106 F. The white blood cell count decreased from 11,400 to 2,550. There was severe abdominal distention necessitating the use of continuous Wangensteen suction. Despite the administration of five blood transfusions and of large quantities of fluids parenterally the patient died on the twenty-second hospital day. Necropsy disclosed nonspecific ulcerative colitis with fibrinous peritonitis, pulmonary embolism with infarction of the right lower pulmonary lobe, dilatation of the right auricle and ventricle, anasarca and bilateral hydrothorax.

CASE 9.—C. C., a man aged 41, an unemployed salesman, entered the University of Chicago Clinics because of a purulent rectal discharge of three years' duration. He had undergone an operation for fistula in ano six months previously. He gave a history of having participated for many years in extragenital intercourse (pederasty), in which he had frequently assumed the feminine role. He denied having indulged in this practice for the past five years. There was no history of buboes or enlarged inguinal nodes. Proctoscopic examination disclosed the presence of a purulent exudate in the rectum and the sigmoid flexure; the rectal mucosa was friable and bled easily. Hospitalization was necessitated by the development of cardiac failure secondary to coronary occlusion.

The Frei reaction was positive, and the lymphogranuloma venereum virus was recovered from several biopsy specimens of the rectal mucosa. Sulfanilamide therapy, begun on the thirty-first hospital day with doses of 2.4 to 3.5 Gm. daily, was continued until a total of 73 Gm. had been administered in twenty days. The level of free sulfanilamide in the blood rose to a peak of 13.5 mg. per hundred cubic centimeters. The inflammatory process gradually subsided, and at the termination of therapy the rectal mucosa appeared proctoscopically to be practically normal. The Frei reaction continued to be positive. Attempts to isolate the virus from several biopsy specimens of the rectal mucosa at this time were unsuccessful. The rectal inflammation recurred within a week after the discontinuance of sulfanilamide. It was not deemed advisable to resume sulfanilamide therapy in the dose previously given because moderate anemia had developed. Consequently, the patient was given nightly retention enemas containing 2.4 Gm. of sulfanilamide dissolved in 250 cc. of warm water. The rectal discharge again decreased, and the mucosal inflammation subsided. The retention enemas were given three times each week for the next four months. The patient continued to improve; the bowel movements decreased to one or two formed stools daily, the rectal discharge disappeared and proctoscopy revealed the mucosa to be almost normal in appearance. A Frei test done during the course of this treatment gave a positive result; on two occasions the virus was not obtained from several biopsy specimens of rectal tissue. The sulfanilamide retention enemas were discontinued after four months. To date, two months later, the rectal mucosa continues to present only a slightly granular appearance and the patient's clinical condition remains satisfactory.

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ABSTRACT OF DISCUSSION

DR. HERBERT T. HAYES, Houston, Texas: My associates and I have had experience with lymphopathia venereum for many years but have always been disheartened by the results of treatment. We have found the incidence of lymphopathia venereum much more frequent in the Negro race. We rarely see a stricture case in private practice. Negroes and especially Negro women make somewhat of an economic problem in almost any Southern city, because after they have had these strictures a good number of years most of them are partial invalids. I agree with the authors that gonorrhea and syphilis should not be considered a causative factor except in rare instances. Before we become aware of the existence of lymphopathia venereum we thought that gonorrhea was the probable causative agent because of its frequency in the rectal smears. Trauma, however, of an inflamed mucosa may at times set up an inflammatory process that will result in a stricture. I agree with the authors' observations on the use of sulfanilamide. We have found it has lessened the discharge, reduced the infection and made the patients feel better. We have observed spectacular results and an apparent cure in 2 cases of early infection of the rectum without definite stricture formation or in what we have frequently referred to as the prestricture stage. In the extremely bad cases I still advocate a colostomy. Patients who have had a colostomy and still have constitutional symptoms, such as anemia, arthritis and any of the sequelae that go with chronic infection, should have a resection of the rectum. Colostomy alone rehabilitates many of these patients. Those who are scar formers are the ones who are most likely to have trouble with lymphopathia venereum, and that is why the Negro race is so susceptible.

DR. MOSES PAULSON, Baltimore: Dr. Palmer and his associates have shown that bowel involvement due to the virus of lymphogranuloma venereum is not restricted to the Negro race, that it is more frequent than is generally appreciated, that at times it is indistinguishable from nonspecific ulcerative colitis and that by the demonstration of virus in intestinal material this disease can be separated from ulcerative colitis, thus delimiting ulcerative colitis and offering another approach to the former. These observations tend to clarify some obscure bowel disorders, and they are confirmatory of my researches in this field, reported between 1936 and 1939. The most conclusive diagnostic procedure is in the isolation of the virus from the involved tissue. Dr. Palmer's method differs only slightly from that of my bowel antigen method. A positive Frei test in one with colitis cannot be taken in itself to diagnose lymphogranuloma venereum colitis because it has definite limitations. The

positive Frei reaction may be produced by an unrelated virus infection antedating, coinciding or postdating the colitis, or by a healed virus infection. The same limitations apply to the neutralization test referred to by Dr. Palmer. There is one situation either ignored or not generally appreciated—that of anergy: a few who harbor this virus and never manifest a positive Frei reaction and those who give no Frei reaction while the involvement is either decidedly acute or severely chronic. Particularly in these groups is the detection of the virus in the bowel involvement by my bowel antigen or Dr. Palmer's method important. I have seen no true fibrotic stricture vanish regardless of the nature of therapy. I have found that the use of sulfonamide derivatives has not infrequently reduced the activity of the process, possibly by diminishing secondary infection.

Dr. Arthur W. Grace, New York: We have been studying lymphogranuloma venereum for nine years at the New York Hospital and have observed that the anal variety of the disease occurs two and a half times as frequently as the inguinal variety and is therefore the commonest of the symptomatic varieties. We have been using the sulfonamide derivatives successfully for the treatment of lymphogranuloma venereum since 1938 and have employed sulfanilamide, sulfathiazole and sulfaguanidine. Sulfathiazole has given the best therapeutic results with the least toxic reaction. It is administered in a dose of 1.5 Gm. three times a day for two to three weeks, followed by 1 Gm. three times a day for another three weeks. This regimen is sufficient to cure all the cases of the inguinal variety of the disease which we have treated. Cases of proctitis without stricture, the earliest manifestation of the anorectal variety of lymphogranuloma venereum, also yield readily to such treatment. The advent of stricture extends the duration of treatment of proctitis to as long as six or twelve months. In these cases several courses of sulfathiazole therapy are given with rest periods of one or two weeks between courses. In over 90 per cent of all cases of the anorectal variety of lymphogranuloma venerum the proctitis is cured or improved by the use of sulfathiazole. Fibrous strictures are unaffected. In their use of mice for evaluating the effect of drugs in the treatment of lymphogranuloma venereum in man, Dr. Palmer and his collaborators administered the drug orally. While performing similar experiments several years ago we noted that the mice did not always consume all of the material offered. By injecting a solution of the drug intraperitoneally, results were obtained similar to those of the authors. For the past four years we have been examining cases of ulcerative colitis first with the Frei test and later with the complement fixation test for lymphogranuloma venereum. No positive reaction has yet been obtained by the use of either test.

Dr. Zacharias Bercovitz, New York: It seems to me that the main value of this discussion is to direct attention to the fact that there are cases of ulcerative colitis in which the Frei test will be found to be positive. We have had that experience in our clinic at the New York Postgraduate Hospital. The Frei test is specific. It is valuable because it helps us to separate from the group of so-called nonspecific ulcerative colitis those whom we can treat specifically. Thus we can help more patients. With the rectal type of stricture we have found that Frei antigen in small doses, 0.1 cc. subcutaneously over a period of eighteen months to two years, has caused complete relaxation of the strictures and, when prior to the injection of the antigen we were unable to pass even a small finger into the rectum, at the end of that time we were able to examine with the standard size sigmoidoscope and find an essentially normal mucosa.

Dr. H. F. Sawyer, Detroit: I wish to substantiate the findings in our clinic of those of the authors and the discussers. I particularly would like to ask Dr. Palmer what effect sulfanilamide has had on the extrarectal lesions. I myself have not seen any appreciable benefits.

Dr. Walter L. Palmer, Chicago: I was glad that Dr. Hayes brought out the great incidence of the disease, particularly the anorectal syndrome, in the Negro race. There is no doubt that it is much more frequent in them than in the white race. We wished to emphasize, however, that it does occur not infrequently in the white race. Dr. Paulson raises two questions: first, whether or not the presence of a positive Frei reaction proves that the lesion in the colon is lymphogranuloma venereum. Of course it doesn't. The positive Frei reaction proves only that the patient has or has had—and we are inclined to think it means he still has—lymphogranuloma venereum. It does not prove the nature of the rectal lesion. With regard to negative Frei reactions, Dr. Paulson is quite right. It is possible for lymphogranuloma venereum to be present with a negative Frei reaction. It is, however, foreign to our experience. I was much interested in the remarks of Dr. Grace with regard to the relative incidence of the inguinal and anorectal varieties of lymphogranuloma. We have had no experience with the extrarectal infections and we have not tried sulfathiazole.

OPPORTUNITIES FOR POSTGRADUATE STUDY FOR NEGRO PRACTICING PHYSICIANS IN THE SOUTH

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There has been an increasing acknowledgment during the past thirty years of the need for keeping the general practitioners of this country abreast of medical advances so that there will not be too wide a hiatus between the development of new principles and technics and their actual application. This concern has been manifested by the American Medical Association since 1913 through its Council on Medical Education and culminated in a comprehensive study [1] of the educational programs of every state during the years 1937 to 1940. This need has also been emphasized by the Commission on Graduate Medical Education in its recent report,[2] and just recently the executive committee of the National Board of Medical Examiners has appointed a committee to study the question as to the best method of providing some kind of recognition for the progressive, up to date, efficient and well trained general practitioner.[3]

Even though such interest has been manifested by these organizations and by many medical schools and medical societies, practicing physicians have not apparently been too concerned about improving themselves. This is true for both Negro and white groups. The 1938 report of the Council on Medical Education and Hospitals of the American Medical Association [4] stated that in twelve states with fairly accurate records only 25 per cent of the practicing physicians engaged in some form of graduate work during the year. In a study [5] of five hundred and twenty-five Negro physicians, it was shown that only 40 per cent had engaged in such activities during a ten year period. This certainly shows a deplorable situation.

Many may be the reasons for this apparent indifference on the part of physicians, but the lack of available opportunities for such experiences may be one of the more important determining causes. This is particularly true for the two thousand five hundred odd Negro physicians practicing in the South, where first class hospitals are not numerous, where contacts with specialists are meager and where educational opportunities have been traditionally limited. In addition, many of these practitioners are the only ones in their communities,

1. Council on Medical Education and Hospitals: Graduate Medical Education in the U. S.: 1. Continuation Study for Practicing Physicians, 1937 to 1940, Chicago, American Medical Association, 1940.
2. Graduate Medical Education, Report of the Commission on Graduate Medical Education, Chicago, The University of Chicago Press, 1940.
3. National Board Appoints Committee on Certification of General Practitioner, editorial, The Diplomate 13: 114 (March) 1941.
4. Council on Medical Education and Hospitals: Medical Education in the United States, 1937-1938, J. A. M. A. 111: 801 (Aug. 27) 1938.
5. Cornely, P. B.: Postgraduate Medical Education and the Negro Physician, J. Nat. M. A. 30: 18-22 (Feb.) 1938.

and all too often their net incomes are far below the average for the country as a whole. This study, therefore, is concerned with the extent and development of postgraduate activities designed wholly or in part for Negro physicians in the South.

METHOD

Letters and questionnaires were sent to various organizations located in seventeen Southern states and the District of Columbia. This included twenty-six medical schools, seventeen constituent state medical societies of the American Medical Association, forty-five constituent local and state medical societies of the National Medical Association and twenty-six Negro hospitals fully or provisionally approved. After a number of requests, sixty-nine, or 60 per cent, of the one hundred fourteen organizations returned their questionnaires. The sixty-nine respondents included twenty-five medical schools two of which were the Negro institutions Howard and Meharry, sixteen white state medical organizations, fifteen Negro medical societies and thirteen Negro hospitals. The questionnaires received were analyzed and certain pertinent data about the postgraduate activities in each state for which there is information available have been recorded in the accompanying table. A fuller description of the postgraduate activities in these states will be the subject of a subsequent paper.

ORGANIZATION AND ADMINISTRATION OF PROGRAMS

Only twelve of the seventeen Southern states and the District of Columbia have developed formal postgraduate programs for Negro physicians which are in existence at present and which are held with some degree of regularity. The five states which do not appear to foster regularly such activities are Delaware, Maryland, Mississippi, Oklahoma and West Virginia. Occasionally, however, organizations in some of these states have offered courses. The Maryland State Tuberculosis Association in 1940 cooperated with the District Tuberculosis Association and the Medico-Chirurgical Society of Washington in sponsoring a three day seminar for Negro physicians, and to this came twenty-three Maryland physicians. Such cooperation is being repeated in 1941. In 1936 the Mississippi State Board of Health, with the aid of the U. S. Children's Bureau, offered a two week course in maternal and child care throughout the year, on the circuit plan, for the Negro physicians in the state. Fifty-five of the fifty-eight Negro physicians in Mississippi attended these courses.[6] In addition, the state health department in cooperation with the Commonwealth Fund sent a Negro physician to Homer G. Phillips Hospital for a ten week course.

There were in the twelve states and the District of Columbia twenty-six opportunities for Negro practicing physicians to engage in continuation study. Of these, nine were sponsored by seven Negro organizations and seventeen by fifteen white groups. Included in the Negro agencies were three hospitals, two medical societies and two medical schools, while the fifteen white groups comprised four medical societies, five medical schools, one board of health and five tuberculosis societies.[7] Thus it is seen that white organizations, particularly the medical schools and voluntary health agencies, have been more active in this field of endeavor than Negro groups. Of particular significance is the fact that four Southern state medical societies, namely Arkansas, Florida, Louisiana and Tennessee, have opened certain of their postgraduate facilities to Negro physicians. The attitude of the Florida Medical Association, Inc., is commendatory and deserves a place of prominence. Up to 1940, Negro physicians were not admitted to the one week postgraduate seminar held annually by the society since 1933. In 1940 the last two days of the seminar were opened to Negro physicians and in 1941 the whole course was made available to all duly licensed Negro physicians on the same basis as white physicians. This arrangement has proved satisfactory and should certainly be given a trial by other state medical societies.

Attention must be called to the fact that in only three of the twenty-six opportunities available were the courses of an itinerant nature so that the instruction was taken to the physician in or near his local community. Practically all the courses, therefore, were held in definitely located centers, so that interested physicians had to commute daily or absent themselves from their practice for the duration of the course. This state of affairs compares unfavorably with the situation for white physicians. According to the report of the American Medical Association,[8] of the one hundred and ten opportunities for postgraduate medical education available in forty-three states, fifty were held in proximity to the physician's home.

SUBJECTS AND INSTRUCTIONS

The subjects offered in these courses may be grouped in five categories. The most common was general subjects of medicine, which was included in eleven of the twenty-six courses. This was followed by obstetrics and gynecology, pediatrics and tuberculosis, which were included either separately or in various combinations in ten, and venereal diseases in eight programs. Next to the general subjects in medicine, the most common combination presented was that of tuberculosis, syphilis, pediatrics and obstetrics. These two types of offerings were the selection in seventeen of the twenty-six courses. It would thus appear that the choice of topics has been based primarily on their importance as disease problems among Negro groups and not particularly on the needs of general practitioners. Nor is there an attempt to organize these courses so that at the end of a certain period of years, let us say four or five, physicians who have regularly attended the courses will feel that they have been educationally refreshed in all sections of their knowledge. In these twenty-six programs, preclinical courses have seldom been included, and such special subjects as malaria, endemic typhus, nutrition and diet, degenerative diseases such as cancer, heart disease and diabetes, which are of importance in the South and in the Negro group, are infrequently touched on.

The instruction in these programs has been through lectures, discussions and clinics. It appears from this analysis that better than half of these offerings have unfortunately depended on lectures and discussions for their teaching procedure. Here again much needs to be done in the organization and presentation of these courses so that they will be most attractive to general practitioners. It has all too often been assumed that men in practice may be taught successfully by the same methods as undergraduates in medicine. This is to be questioned, since even the teaching of medical students is not on too firm a footing.

6. Such a project was also put into operation in 1937 in Georgia and in 1938 in Alabama.

7. These sponsoring agencies, as may be noted in the table, were helped by a variety of other institutions and groups.

8. Council on Medical Education and Hospitals: Graduate Medical Education in the U. S., p. 23.

Continuation Courses for Negro Practicing Physicians in the South, 1939-1940

State	Sponsoring Agencies	Date of Initiation	Subjects	Duration of Course	How Often Given	Registration Fee	Yearly Attendance	Contributing Agencies and Funds
Alabama								
Tuskegee.....	John A. Andrew Clinical Society	1912	General	1 week	Annually	$5	200-250	John A. Andrew Clinical Society; Tuskegee Institute
Arkansas								
(State circuit).	State medical society and State board of health	1935	Obstetrics and pediatrics	1 day weekly, 6 times	Annually	None	Not given	State medical society, state board of health, U. S. Children's Bureau
District of Columbia								
Washington...	D. C. Tuberculosis Assn., Social Hygiene Society, Maryland, Tuberculosis Assn., Medico-Chirurgical Society, Howard University College of Medicine	1940	Tuberculosis, syphilis, obstetrics, pediatrics	3 days	Annually	None	150	Same as sponsoring agencies
Washington...	Howard University College of Medicine	1937	Venereal diseases	3 months	4 times annually	$20	20 (limited)	College of Medicine, U. S. Public Health Service, District of Columbia Health Department, and Freedmen's Hospital
Florida								
Orlando.....	Florida Tuberculosis and Health Assn.	1939	Tuberculosis	1 week	Offered only once	None	10	Tuberculosis Association and state tuberculosis sanatorium
Jacksonville...	Florida Tuberculosis and Health Assn.	1940	Tuberculosis, syphilis, obstetrics, pediatrics	3 days	Annually	None	35	Tuberculosis Association, National Tuberculosis Assn., state board of health, and Julius Rosenwald Fund
Jacksonville...	Florida Medical Association, Inc.	1940	General	1 week	Annually	$5	20-30	Florida Medical Association, Inc.
Tallahassee....	Florida A. & M. Clinical Association	1929	General	3 days	Annually	$3	50-75	Clinical Association, Florida A. & M. College
Georgia								
Augusta.....	University of Georgia School of Medicine	1935	General	2 weeks	Annually	$1 for certificate	25-50	Julius Rosenwald Fund for first two years, and School of Medicine
Kentucky								
Louisville.....	University of Louisville School of Medicine	1936	Medicine, pediatrics, obstetrics	2 months	Annually	None	Limited to 8 M.D.'s	School of Medicine
Louisiana								
New Orleans...	Flint Goodridge Hospital	1936	General	2 weeks	Annually	$5	40	Flint Goodridge Hospital, National Tuberculosis Assn., private contribution
New Orleans...	Flint Goodridge Hospital	1938	General	Monthly seminars	Throughout the year	None	20	Hospital
New Orleans...	Flint Goodridge Hospital	1938	Tuberculosis	Biweekly lectures	Throughout year	None	25% of M.D.'s in city	Hospital
State circuit...	Louisiana State Medical Society	1936	Obstetrics, pediatrics, cancer	Five 2 hour sessions	Annually	None	5-15	Medical Society, State Board of Health
Missouri								
St. Louis.....	St. Louis University School of Medicine	1937	Internal medicine, general surgery, obstetrics, pediatrics, physical diagnosis	4 weeks	Annually	$15-$20	25-40	School of Medicine, St. Mary's Infirmary
St. Louis.....	Homer G. Phillips Hospital	1937	Obstetrics, tuberculosis, syphilis	4 days	Annually	None	60-115	Hospital, Julius Rosenwald Fund, St. Louis Health Department and Federal Government
St. Louis.....	Tuberculosis and Health Society of St. Louis	1939	Obstetrics, tuberculosis, syphilis, pediatrics	3 days	Annually	None	90-142	Tuberculosis and Health Society, Missouri Tuberculosis Assn., Mound City Medical Forum, and St. Louis Health Department
North Carolina								
Durham.....	Duke University	1935	Venereal disease, obstetrics, gynecology, pediatrics, tuberculosis	3 days	Annually	$5	25-40	Duke University, Lincoln Hospital, North Carolina State Department of Education

Continuation Courses for Negro Practicing Physicians in the South, 1939-1940—Continued

State	Sponsoring Agencies	Date of Initiation	Subjects	Duration of Course	How Often Given	Registration Fee	Yearly Attendance	Contributing Agencies and Funds
South Carolina								
Orangeburg....	South Carolina State Tuberculosis Assn.	1941	Syphilis, tuberculosis, obstetrics, pediatrics	3 days	Annually	None	38	State Tuberculosis Assn., National Tuberculosis Assn., State Board of Health, Palmetto Medical Assn., U. S. Public Health Service
Charleston....	Charleston Tuberculosis Assn.	Not given	Tuberculosis	Not given	Annually	None	Total of 50 physicians have attended all courses	Tuberculosis Association, Pine Haven Sanatorium
Tennessee								
Nashville.....	Meharry Medical College	1938	General	2 weeks	Annually	$10	10-14	Medical College
Nashville.....	Meharry Medical College	1940	Pediatrics	2 weeks	Annually	None	Not given	South Carolina State Health Department and Medical College
State circuit...	Tennessee State Medical Association	1937	Obstetrics and pediatrics	Weekly lecture for 16 weeks in each of 10 districts	Throughout year	$5	57-84	State Medical Society, Commonwealth Fund, Medical Schools of Vanderbilt and University of Tennessee
Texas								
Prairie View...	Texas Tuberculosis Assn.	1937	Tuberculosis, syphilis, obstetrics, pediatrics	4 days	Annually	None	50-114	Tuberculosis Association, National Tuberculosis Association, State Board of Health, and Prairie View College
Virginia								
Richmond.....	Medical College of Virginia	1931	General	2 weeks	Annually	$10	18-42	Medical College and General Education Board

The duration of the courses varied from three days to a year. The majority of the courses were under one week in length, since ten, or almost half, were in this division. The remainder fell into the following categories: four of one week's duration, six of two weeks, three of one to three months and two throughout the year, and for one no information was given. The two which were offered throughout the year consisted of monthly or biweekly seminars for local physicians.

FINANCIAL SUPPORT AND PHYSICIANS' INTEREST

A variety of organizations have given financial aid and provided personnel and facilities for these meetings. Among these may be mentioned the United States Public Health Service, the United States Children's Bureau, the Julius Rosenwald Fund, the National Tuberculosis Association, the Commonwealth Fund, the General Education Board of New York City and the various local and state official and nonofficial groups. As a result of this, it is found that fourteen, or more than half, of these programs were offered to Negro physicians free of charge. The remaining twelve had extremely moderate registration fees as follows: one of $1, one of $3, six of $5, two of $10, one of $15 and one of $20. From this standpoint, it would appear that Negro physicians have no complaint to offer. The same situation obtains for white physicians where itinerant courses are concerned. Of the fifty courses offered in 1938-1939, thirty-seven charged no registration fee, while the remainder had fees varying from $2 to $15. However, for continuation courses featuring clinical material and held at one center, white physicians had to pay larger sums, since in forty-nine of the sixty programs fees varied from $5 to $400.[9]

It is difficult to obtain an accurate idea of the total attendance of Negro physicians practicing in the South who participated in these courses in one particular year. In some of the questionnaires the attendance reported included other professional groups such as those of dentists and nurses, while in others the attendance included physicians practicing in Northern states. The total attendance as reported by these states numbered approximately 1,200 physicians for the year 1939-1940. On the basis of this, it could be assumed that possibly from 800 to 1,000 Negro physicians practicing in the South attended courses offered in that year. This would mean that from 30 to 40 per cent of the Negro physicians in this geographic area availed themselves of these educational opportunities. This percentage compares favorably with the already quoted percentage of 25 for white physicians for the year 1938. Although this comparison is good, it must be admitted that there is a sizable percentage of physicians who are not making any effort to improve themselves continually.

9. Council on Medical Education and Hospitals: Graduate Medical Education in the U. S., p. 42.

COMMENT

This analysis shows that even though many Southern states have developed postgraduate programs for Negro physicians, the number of these activities is admittedly insufficient; yet facilities and personnel are available in the South which could be developed to the advantage of these practitioners. This applies both to Negro and to white organizations, and certainly the eventual solution of this problem depends on the active and whole hearted cooperation of these two groups. What then are possible approaches to this problem? The following suggestions may be put forth:

1. Negro hospitals, particularly those which have been approved by the American Medical Association and the American College of Surgeons, should develop refresher courses for physicians in their locality. The example of Flint Goodridge Hospital of Dillard University is one worthy of emulation.

2. The medical schools in the South should become more concerned about the postgraduate education of Negro physicians. Of the twenty-five medical schools in this area, only five are at present offering courses for

Negroes. Certainly it would appear that the other twenty schools would develop programs comparable to those of the Medical College of Virginia, the St. Louis University School of Medicine and Duke University School of Medicine.

3. The examples which have been set by the state medical association of Florida and those of Arkansas, Louisiana and Tennessee should gradually cause other Southern state and county medical societies to open some of their postgraduate activities to Negro physicians. Just as the Florida Medical Association, Inc., gradually opened its postgraduate seminar to Negro physicians in the state, so other associations could experiment in this direction.

4. Negro medical societies also have a responsibility in this sphere which thus far they have neglected. These organizations should develop annual refresher courses of three to five days' duration for their membership. By pooling the resources of their communities, this could be done without too great an outlay of money. The appointment of strong and active postgraduate committees to explore possibilities and formulate plans would be steps in the right direction.

5. The postgraduate programs which are at present in operation should be reevaluated so that the educational needs of the general practitioner are met more fully. Refresher courses would serve a more useful purpose if they were so organized that they would cover definite units of study yearly and bring up to date such basic knowledge as bacteriology, pathology and physiology, in addition to reviewing new technic, methods of treatment and diagnosis in the fields of internal medicine, obstetrics, minor surgery, venereal diseases and the like. Only in this manner will refresher courses have a purposeful meaning.

SUMMARY

1. Twelve of the seventeen Southern states and the District of Columbia have at present postgraduate programs, which are held with some degree of regularity, designed as a whole or in part for Negro physicians.

2. There are in these twelve states and the District of Columbia twenty-six opportunities for Negro physicians to engage in continuation study. Nine of these have been sponsored by seven Negro organizations and seventeen by fifteen white groups.

3. General subjects in medicine are the most popular, since these were offered in eleven of the twenty-six courses. Obstetrics, pediatrics, tuberculosis and syphilis are the other topics most commonly included.

4. The courses vary in length from three days to a year, but almost half are under a week's duration.

5. The majority of the courses are offered free of charge, and those which require a fee have a nominal one varying from $1 to $20.

6. Approximately 30 to 40 per cent of the physicians practicing in the South availed themselves of these educational opportunities in 1939-1940.

Industrial Research Laboratories.—Some of the facts relating to the United States are striking. In 1940 two thousand two hundred industrial corporations maintained three thousand five hundred research laboratories which employed seventy thousand workers at a cost of seventy-five million pounds. In these, particular emphasis is directed toward personal qualities of the prospective employee as distinguished from scholarship. Creative urge, receptiveness to new ideas and intellectual integrity are particularly important.—The Spiritual Value of Research, *Nature*, Dec. 6, 1941.

Clinical Notes, Suggestions and New Instruments

A TRANSFUSION REACTION FOLLOWING THE USE OF UNIVERSAL BLOOD

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It is difficult to evaluate the frequency and severity of reactions ascribable to the presence of isoantibodies in universal blood (O blood). Minor reactions may occur frequently while severe and fatal reactions with demonstrable hemolysis or agglutination are relatively rare. The statistical approach to the problem is obviously difficult. However, the literature contains a number of reports some of which state observations only during and following reactions while others include detailed laboratory data necessary for a study of the factors involved. Without attempting to review the literature completely, we shall cite some papers pertaining to the question of the high titered donor.

Levine and Mabee [1] and Freeman and Whitehouse [2] on the basis of their "in vitro" studies cautioned against the use of "dangerous" universal blood. Wildegans [3] discussed the universal donor and referred to several specific accidents. An extensive analysis of reactions to transfusions of group O blood was published in 1935 by Gesse.[4] This article presents a collection of 46 cases presenting severe hemolytic reactions of which 20 terminated fatally. Muller and Balgairies [5] reported a transfusion with shock following the administration of universal blood of high anti-A titer to a group A recipient. DeGowin [6] reviewed his experiences with 3,500 transfusions and commented on one hemolytic reaction in detail in which high agglutinin titers were thought to be responsible. Levine and Katzin,[7] after corresponding with 350 hospitals, found that 225 used universal donors to some extent and that only 8 used tests to ascertain agglutinin titers. They mentioned three known reactions from this source. MacKay [8] described a case of acute agranulocytosis in which a transfusion with universal blood was given. The patient afterward became icteric, and erythrophagocytosis was noticed in the blood smear. Schürch and Willenegger [9] presented fourteen reactions in one hundred and sixty-seven transfusions. Twelve reactions occurred when universal donors were used for A recipients, and 2 of these with well defined hemolytic signs were definitely shown to have high anti-A agglutinin titers. The others were not determined. In an analysis of 3,000 transfusions, Wiener and his co-workers [10] mentioned the dangerous universal donor as a source of reactions.

Through the courtesy of Drs. McKay and Wolfe, we have had the opportunity of studying a hemolytic reaction in a man aged 77 following the transfusion of universal blood.

The patient presented a large, indirect, complete inguinal hernia on the right side which he had attempted to support by means of a truss for the past twelve years. It had always been reducible until two weeks before admission, at which time he complained of pain in the lower part of the abdomen, diarrhea and inability to reduce the hernia. He was hospital-

From the laboratories of the Buffalo General Hospital.

1. Levine, Philip, and Mabee, Jennie: A Dangerous Universal Donor Detected by the Direct Matching of Blood, J. Immunol. 8:423 (Nov.) 1923.

2. Freeman, G. C., and Whitehouse, A. J.: The "Dangerous Universal Donor," Am. J. M. Sc. 172:664 (Nov.) 1926.

3. Wildegans, H.: Die Todesfälle nach Bluttransfusionen, Deutsche med. Wchnschr. 56:2031 (Nov. 28) 1930.

4. Gesse, E. R.: Ueber die Verwendung des sogenannten Universalspenders bei der Bluttransfusion, Deutsche Ztschr. f. Chir. 245:371, 1935.

5. Muller, M., and Balgairies, E.: Taux élevé d'agglutinines dans le sérum d'un donneur universel dangereux, Compt. rend. Soc. de biol. 121:1447 (March) 1936.

6. DeGowin, E. L.: Grave Sequelae of Blood Transfusions: A Clinical Study of Thirteen Cases Occurring in 3,500 Blood Transfusions, Ann. Int. Med. 11:1777 (April) 1938.

7. Levine, Philip, and Katzin, E. M.: A Survey of Blood Transfusion in America, J. A. M. A. 110:1243 (April 16) 1938.

8. MacKay, Ivan: Two Cases of Hematological Interest, Brit. M. J. 1:494 (March 11) 1939.

9. Schürch, O., and Willenegger, H.: Klinische Erfahrungen mit der Transfusion von Konserviertem blut, Schweiz. med. Wchnschr. 71:105 (Feb.) 1941.

10. Wiener, A. S.; Orenland, B. J.; Hyman, M. A., and Samwick, A. A.: Transfusion Reactions, Am. J. Clin. Path. 11:102 (Feb.) 1941.

ized in another institution and the hernia was reduced mechanically, relieving him of his symptoms until five days prior to admission to our hospital. For a period of several months he had been taking digitalis for cardiac irregularity.

On admission the temperature was 99.8 F. rectally, the pulse was 50 and irregular and the respiratory rate was 18. The blood pressure was 140 systolic and 70 diastolic. He complained of severe pain in the lower part of the abdomen without nausea or emesis. On examination, besides the slow irregularity of the cardiac rhythm, the hernia was found to be nonreducible and he was immediately operated on and an incarcerated hernia was relieved and 6 inches of devitalized small intestine was resected followed by entero-anastomosis.

On July 4, 1941, the first postoperative day, signs of ileus developed and duodenal decompression was instituted. The temperature was 103 F. and the blood pressure 150 systolic and 64 diastolic. At 10:30 p. m. a blood transfusion was started. The patient belonged to blood group A, blood type MN, Rh positive. Cross matching was carried out by mixing the cells of the donor and the serum of the patient and keeping the mixtures at room temperature as well as at 37 C. (98.6 F.) for one hour, after which time the tubes were spun down. The cells of the donor were perfectly compatible toward the serum of the patient. A subsequent determination of the titer of the antibodies of the donor's plasma revealed an anti-A titer of 1:128 and an anti-B titer of 1:64 as determined by test tube titration.

The patient experienced a severe chill and a rise in temperature to 106.8 F. after 250 cc. of citrated O blood had been administered. Slight cyanosis was present. The respirations were labored and the pulse weak and thready. The blood pressure was 116 systolic and 68 diastolic.

By 1 o'clock the following morning the blood pressure had fallen to 80 systolic and 40 diastolic and distinct diaphoresis and pulmonary edema were noticed. Treatment consisted of morphine, atropine and oxygen. During the day he responded slightly and the blood pressure returned to 110 systolic and 56 diastolic following the administration of 500 cc. of diluted pooled plasma and 1,000 cc. of 5 per cent dextrose and saline solution. Blood chemistry determinations before the plasma was given revealed dextrose equal to 156 mg. and urea nitrogen equal to 25 mg. per hundred cubic centimeters and sodium chloride equal to 487 mg. per hundred cubic centimeters. The carbon dioxide combining power was 53 volumes per cent. The icteric index of the patient's plasma was found to be 20 with slight hemolysis and biphasic van den Bergh of 0.6 mg. per hundred cubic centimeters. A single specimen of urine was observed to be orange colored with no red blood cells.

The next day therapy with intravenous infusion of saline solution and sodium sulfapyridine was started after definite signs of pulmonary consolidation had been discovered in the left base. The duodenal decompression was continued and the abdomen remained soft.

From July 7 to July 9 the patient was stuporous and incontinent. A blood culture taken on July 6 was reported negative. On July 7 the icteric index was 50 and the van den Bergh biphasic and quantitatively 2.8 mg. per hundred cubic centimeters. The hemoglobin level remained constantly over 100 per cent. The urine looked amber and clear and the sediment showed 7 to 10 red blood cells per high power field. Pulmonary edema became severe and the patient died July 9.

COMMENT AND SUMMARY

About 250 cc. of blood of group O (universal blood) was transfused into a man aged 77 belonging to blood group A. The immediate reaction to the transfusion consisted of a sharp rise in temperature. The increases in the icteric index and the quantitative van den Bergh reaction point to definite hemolysis. The serum of the patient did not influence at all the cells of the donor, as demonstrated by careful cross matching even at 37 C. (98.6 F.). However, the serum of the donor contained a relatively high titer of anti-A antibodies, the presence of which we believe was the cause of the reaction observed. We feel, therefore, that this case demonstrates the fact that O blood containing potent isoantibodies cannot necessarily be considered safe universal blood.

Special Article

THE PHARMACOPEIA AND THE PHYSICIAN

THE TREATMENT OF VERTIGO AND SYNCOPE

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This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Vertigo and syncope are common symptomatic manifestations, yet many physicians possess inadequate knowledge not only of the treatment but also of the fundamental nature of these states. Although usually vertigo and syncope are unrelated both in their pathogenesis and in their treatment, it is justifiable to consider them together because they are confused with each other. Vertigo, in a strict sense, describes an experience in which the patient has the sensation that the outer world is revolving about him ("objective vertigo") or that he himself is moving in space ("subjective vertigo"). The latter experience can be reproduced simply by subjecting the patient to rapid whirling movements of some duration. Frequently, however, vertigo is used erroneously as a synonym for "dizziness" or "giddiness" to indicate an unpleasant sensation of disturbed relationship to surrounding objects in space. The terms "dizziness" and "giddiness" should be restricted to an abnormal sensation of unsteadiness characterized by a feeling of movement within the head without the experience of the external world or the patient himself being in motion. Dizziness or giddiness, as a subjective sensation, should not be confused with the sensations associated with ataxia. At times true vertigo and dizziness can coexist.

On the basis of such a definition, true vertigo has more specific diagnostic significance in neurologic and psychiatric disturbances than does dizziness or giddiness. Vertigo is usually accompanied by difficulty with locomotion and at times with a sensation of sinking. However, vertigo as a rule has no relation to syncope, while dizziness is frequently a *forme fruste* manifestation of syncope, although dizziness is frequently associated with bodily states independent of syncope. Dizziness is often a manifestation of any one of a number of conditions, which include a minor or severe injury to the head, arterial hypertension, cerebral arteriosclerosis, cerebrovascular accidents, intoxications, petit mal or grand mal epilepsy, cerebral neoplasms or abscesses, epileptic aura, psychoneurosis and psychosis.

Because patients describe vertigo or giddiness indiscriminately as "swimming," "reeling," "dizziness," "light headedness," "faintness," "drunk feeling" or "sense of foolishness" the first step in the treatment of vertigo and dizziness is the proper interpretation of the patient's complaints. Without this, effective treatment is not possible.

Dr. Weiss died, January 31.

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VERTIGO

From a broad physiologic point of view, vertigo is the result of certain types of disturbances of the nervous mechanisms involved in the maintenance of normal body balance. While the "master organs" in maintaining balance are the vestibular portions of the labyrinths with their nerve connections through the vestibular portion of the eighth nerve to the vestibular nuclei in the medulla oblongata, important contributory roles are played by the eyes, the muscles of the head and neck, the deep tendon and the joint sensations in general, and by the cutaneous tactile sensations. It should also be recalled that the vestibular nuclei have intimate anatomic and functional connections with certain parts of the cerebellum and cortex as well as with the centers of the oculomotor, vagus and accessory nerves. Hence certain types of functional or structural disturbance of any of these centers or of their nervous connections can cause vertigo.

Usually in true vertigo external objects seem to move in horizontal planes in rotary fashion. A sensation of vertical movement occurs more rarely. Attacks of true vertigo as a rule develop suddenly, are of relatively short duration and are usually accompanied by disturbed locomotion. The sensation of violent rotation may be so strong that the patient is thrown to the ground. Falling and inability to move without convulsions or without loss of consciousness may be prominent features in severe attacks of vertigo. In some of the attacks of vertigo or Ménière's syndrome, dizziness and vasomotor reactions, and rarely syncope with unconsciousness, can also be present. Frequently nausea and vomiting and usually nystagmus accompany attacks of vertigo. In milder attacks the sensation of rotation may be slight and fleeting. These features, and others, may differentiate the attack from syncope, epileptic seizures and cataplexy. In general the more acute the causative lesion, the more intense the vertigo. Thus a slowly progressing suppurative destruction of the labyrinth is usually not associated with vertigo.

Among systemic diseases, infections, arterial hypertension, severe anemia and leukemia can on rare occasions be responsible for vertigo presumably by causing local hemorrhages or other types of disturbance of the function of the labyrinth or other nervous mechanisms. Arteriosclerosis with thrombosis or rupture of the cerebral vessels can also be responsible for vertigo. Dizziness, however, more often than vertigo, is a symptom of these diseases.

While the most intense type of vertigo is a phase of classic Ménière's syndrome (recurrent attacks of severe vertigo, nausea, vomiting, tinnitus, nystagmus and deafness), vertigo as a presenting symptom is a frequent manifestation of many other organic and transient physiologic disturbances of the brain, including psychoneurosis and psychosis. The present clinical knowledge of vertigo is based mainly on investigations of structural lesions of the seventh nerve and its pathways. The earlier anatomic contributions, however, bearing on the pathogenesis of vertigo and Ménière's syndrome are often not reliable. Thus it is doubtful whether lesions within the bony canal of the eighth nerve are responsible for vertigo, for it would be unusual if such a lesion did not affect the seventh nerve; and yet a combination of vertigo and seventh nerve irritation or palsy is rare in the clinic. In addition to diseases of the labyrinth, among the organic diseases associated with severe vertigo are concussions of the brain and lesions of the fourth ventricle (brain stem) including those caused by thrombosis of the posterior inferior cerebellar artery, encephalitis and multiple sclerosis. Syphilitic meningitis can cause vertigo if it is associated with a local meningeal reaction in the cerebellopontile angle. Pontile tumors and tumors of the cerebellopontile angle can cause tinnitus and deafness but only rarely vertigo. Cerebellar lesions do not usually cause vertigo, with the exception that tumors of the middle lobe can be associated with vertigo, presumably as a result of secondary irritation of the brain stem. For reasons which are not clear, tumors of the frontal lobe can at times give rise to vertigo.

In by far the majority of instances of severe vertigo alone or in association with tinnitus, vomiting and deafness (Ménière's syndrome), underlying structural lesions cannot be demonstrated. The attacks, which are unpredictable, are usually dominated by vertigo and related symptoms. Interparoxysmally, tinnitus and deafness are the usual features. Frequently in the early attacks vertigo alone or vertigo and tinnitus are the precursors of typical attacks of Ménière's syndrome. The differentiation between Ménière's syndrome and pseudo-Ménière's syndrome is often arbitrary. Muscular unbalance of the eyes can be responsible for vertigo, and caisson workers and aviators may complain of vertigo. Certain drugs such as the salicylates, quinine and nicotine can cause this symptom. Vertigo can be caused at times by respiratory infections such as "grip" or true influenza ("infectious labyrinthitis"), and it may represent an aura in epilepsy or be the equivalent of an epileptic seizure. Disturbance of the cerebral circulation associated with uncomplicated arterial hypertension or with sudden fluctuation of the arterial pressure is usually not responsible for vertigo or Ménière's syndrome. The appearance of attacks of vertigo in patients with arterial hypertension is usually indicative of cerebral vascular accidents.

The point, however, least appreciated by physicians is that in a small group of patients periodic attacks of vertigo or Ménière's syndrome can be the presenting manifestation of psychic disorders. These patients with vertigo of "functional" etiology are often labeled psychoneurotic. They have a nervous system inherited from their ancestors in whom in the direct or indirect line psychoses of varying degree were usually present. Not infrequently, some of the relatives have been "eccentric," "highly nervous," "worrisome" or subject to periodic "nervous breakdowns." The past emotional experiences of these patients are within the normal. Their intellectual endowment and performance are usually normal or above. Periodic interference with normal activity, however, is usually caused by functional disturbance of "vegetative" centers of the brain stem, including vertigo. Some of these functional disturbances follow strict physiologic patterns, and the severity and periodicity of the clinical picture varies considerably. These persons may have a low basal metabolic rate without myxedema. Periodic nystagmus, transient hyperactivity of the carotid sinus reflexes, excessive vasomotor fluctuations including vasospasms, disturbances of the thermal sensations and regulations, nausea, vomiting, intestinal cramp, allergic reactions and mucous colitis are present in various combinations. Associated with these disturbances are attacks of emotional anxiety (angor animi) and a sensation of bodily weakness. The symptoms of these patients, including vertigo, may have

a tendency to recurrence without progression. At times, however, these attacks long precede a psychosis. It is essential that this group of patients should not be confused with patients suffering from vertigo with secondary anxiety neurosis.

From the foregoing considerations of the underlying disturbances, it is clear that an effective schematic treatment for vertigo cannot be expected. Whenever feasible the primary cause of vertigo should be rectified. It is for this reason that elicitation of the specific cause of vertigo is the first step in its treatment. Elimination of foci of infection, including removal of teeth, tonsils and gallbladder, often advocated, are usually useless or at best of only secondary importance. Rest in bed during the attacks with avoidance of bodily motion ameliorates the intensity of vertigo. We do not possess drugs with a specific effect on vertigo. In mild cases chloretone or chloral hydrate or bromides 0.75 to 1 Gm. (10 to 15 grains) every four to six hours can be helpful. The barbiturates, especially phenobarbital, are usually but mildly effective. Of phenobarbital or pentobarbital 0.1 Gm. (1½ grains) is given three to four times daily. There are patients with vertigo or Ménière's syndrome in whom the symptoms are aggravated by barbiturates.

The treatment of vertigo associated with Ménière's syndrome requires special consideration. The very fact that a beneficial effect has been attributed to so wide a variety of therapeutic agents raises suspicion concerning their true efficacy. Epinephrine, atropine, quinine, choline derivatives, pilocarpine, histamine, dehydration, low sodium-high postassium diets, potassium chloride, nicotinic acid, thiamine, the high frequency current and diathermy are among the measures advocated. Therapeutic optimism, lack of adequate controls, irregular occurrence of the attacks and, most of all, lack of appreciation of the fact that many instances of Ménière's syndrome are transient and often of functional origin explain the short life of these various therapeutic claims. Many of the patients with vertigo or with Ménière's syndrome are quite susceptible to psychotherapeutic influences. Often minute attention to the patient and general encouragement rather than the drugs are the effective component in the management.

Among the more recent therapeutic practices the following should be mentioned: Mygind and Dederding [1] were the first to advocate that Ménière's "disease" is associated with disturbance of the salt and water metabolism and that edema of the labyrinth is responsible for the symptoms. Furstenberg, Lashmet and Lathrop [2] claim that retention of sodium and resultant local edema intensify or are responsible for the attack. They propose a dietary regimen free from or relatively low in sodium in which elimination of sodium is enhanced by the addition of ammonium chloride. Ammonium chloride is given in doses of 3 Gm. (6 enteric coated capsules each 0.48 Gm.) three times daily with meals, added to the diet. Talbott and Brown,[3] however, were unable to demonstrate chemical changes indicative of sodium or water retention in the blood, and they concluded that gross retention of water and salt by the body is not the precipitating agent in acute attacks. These authors suspected that in the low sodium diet the relative and often absolute increase in the potassium content was the effective agent. They therefore undertook a study of the effect of a diet normal in sodium to which 6 to 10 Gm. of potassium chloride had been added daily. These investigators claim that, although such a therapeutic regimen cannot be considered as a cure for all the symptoms, nevertheless clinical improvement has been impressive. None of the 48 patients required surgical treatment. The precise action of potassium chloride in vertigo, however, remains unknown. Talbott and Brown suggest that in addition to the diuretic effect of potassium chloride, which hastens the elimination of water and sodium, a disturbance of the optimal concentration of potassium interferes with normal nerve conduction.

In the majority of cases the dietary and drug regimens outlined had to be maintained indefinitely. Both the original and the modified low sodium dietary regimens lack, however, definite rational biochemical and physiologic basis. Although several reports in the literature describe improvement or relief as a result of the low sodium or high potassium methods of treatment, this therapy failed to benefit appreciably the attacks of vertigo in a group of patients that I observed during the past seven years. Further, the specificity of the low sodium or high potassium regimen is rivaled by similar claims of benefit from several other methods of treatment.

Sheldon and Horton [4] claim that the intravenous administration of histamine is beneficial in the attacks of Ménière's disease. About 1.9 mg. of histamine phosphate in 250 cc. of physiologic solution of sodium chloride was infused during a period of one and a half hours. This infusion was repeated on two or three successive days with some of the patients. No other medication was used simultaneously for 11 patients, and 8 others received ammonium chloride and potassium nitrate for several months. A strikingly beneficial effect is attributed to histamine in Ménière's disease by these investigators. From what is known of the bodily effects of histamine and of its short persistence of action, it is difficult to understand the rationale of this procedure. Until further confirmation of this work, no final opinion can be expressed on the therapeutic value of histamine in the treatment of this type of vertigo. Horton [5] has stated recently that about 90 per cent of the patients treated with histamine administered intravenously experience recurrent attacks of vertigo unless there is continued treatment with histamine subcutaneously or with one of the other forms of medical procedure.

Harris and Moore [6] claim beneficial results in the treatment of Ménière's syndrome with a diet high in vitamins and proteins. To this diet nicotinic acid and thiamine are added. Atkinson [7] suggests, on rather

1. Mygind, S. H.: Hypertensio auris internae intermittens, Tr. Dansk Oto-laryngologisk Selskabs Forhandlinger, in Hospitalstid. **67**: 56, 1924. Dederding, D.: Clinical and Experimental Examinations in Patients Suffering from Morbus Menieri, Including Study of Problem of Bone Conduction, Acta oto-laryng. (supp. 10) **1**: 1-156, (supp. 11) **2**: 1-213, 1929; Our Ménière Treatment, ibid. **16**: 404-415, 1931. Mygind, S. H., and Dederding, D.: The Significance of Water Metabolism in General Pathology as Demonstrated by Experiments on the Ear, ibid. **17**: 424-466, 1932; II. Clinical Experiments with Reference to the Influence of Water Metabolism on the Ear, Ann. Otol., Rhin. & Laryng. **47**: 360-369, 1938.

2. Furstenberg, A. C.; Lashmet, F. H., and Lathrop, F.: Ménière's Symptom Complex: Medical Treatment, Ann. Otol. Rhin. & Laryng. **43**: 1035-1046, 1934.

3. Talbott, J. H., and Brown, M. R.: Ménière's Syndrome: Acid-Base Constituents of the Blood; Treatment with Potassium Chloride, J. A. M. A. **114**: 125-130 (Jan. 13) 1940.

4. Sheldon, C. H., and Horton, B. T.: Treatment of Ménière's Disease with Histamine Administered Intravenously, Proc. Staff Meet., Mayo Clin. **15**: 17-21, 1940.

5. Horton, B. T., cited by Simonton, K. M.: The Symptom of Dizziness: Its Significance in General Practice, Proc. Staff Meet., Mayo Clin. **16**: 465-470, 1941.

6. Harris, H. E., and Moore, F. M., Sr.: The Use of Nicotinic Acid and Thiamine Chloride in the Treatment of Ménière's Syndrome, M. Clin. North America **24**: 533-542, 1940.

7. Atkinson, Miles: Observations on the Etiology and Treatment of Ménière's Syndrome, J. A. M. A. **116**: 1753-1760 (April 19) 1941.

meager evidence, that Ménière's syndrome is the result of vasomotor disturbance, which in one group of cases is allergic in origin and in the other is due to vasomotor spasm. According to Atkinson the allergic group can be benefited by intracutaneous and subcutaneous desensitization with histamine. In the vasoconstrictor group it is claimed that nicotinic acid and thiamine are beneficial.

Just as the medical treatment of vertigo has failed to yield clearcut results, so also have certain types of surgical therapy. For about a decade "surgical decompression" of the labyrinth has been practiced, particularly by the British surgeons. This practice has been based mainly on the suggestions of Cheatle,[8] who claimed that Ménière's syndrome depended on increased pressure in the labyrinth. Notwithstanding the claims for their effectiveness, these procedures are no longer practiced. At present intracranial division of the auditory nerves is performed in the treatment of severe recurrent vertigo of Ménière's syndrome. Although Charcot as early as 1874 suggested this operation and Frazier[9] performed it in 1912, it was Dandy[10] who first practiced it effectively, doing a partial or complete resection. Benefit from this surgical procedure has been reported by others.[11] Crowe[12] more recently reported the therapeutic results with a group of 94 patients operated on by Dandy. In 49 cases the auditory nerve was divided completely and in 45 cases only partially. Vertigo was relieved in the entire group, while the improvement in the tinnitus was less uniform, in some instances being worse after the operation. In the group with partial resection the hearing improved in 22 per cent, but in others it became worse. If this surgical procedure is advised, the patient should clearly understand that tinnitus will probably persist.

TABLE 1.—*Comparative Features of Syncope and of Epileptic Seizures*

	In Syncope	In Epilepsy
Predisposing factors		
Emotion	Frequent	Fairly frequent
Physical fatigue	Frequent	Fairly frequent
Irritating lesions of viscera	Frequent	Rare
Vascular reflex	Frequent	Rare
Cardiovascular disturbance	Frequent	Rare
Inherited constitution	Probably rare	Probably rare
Upright position	Frequent	Frequent
Horizontal position	Rare	Frequent
Sleep	Rare	Frequent
Age	Any	Any
Manifestations of attacks		
Aura (visual, auditory, sensory)	Frequent	Frequent
Duration of aura	Very short	Relatively prolonged
Angor animi	Frequent	Frequent
Olfactory aura	Absent	Fairly rare
Sudden onset	Relatively frequent	Frequent
Groaning	Usually absent	Frequent
Loss of response with maintained motor function	Rare	In petit mal, common
Color of face	Pale	At first pale, then flushed
Convulsions	If present, mild; preceded by collapse	Often initial and severe
Localized convulsions	Usually absent	Frequent
Biting of tongue	Rare	Common
Perspiration	Frequent, cold	Frequent, warm
Heart rate	Slow, normal or rapid	Normal or rapid
Blood pressure	Usually low; at times normal	Normal or elevated
Weak or absent pulse	Common	Rare
Respiration	Quiet, shallow or slow	Stertorous and labored
Vomiting	Frequent	Frequent
Micturition	Fairly frequent	Frequent
Defecation	Rare	Frequent
Duration of attacks	Short (seconds or minutes)	Longer
Postseizure confusion	Rare	Frequent
Postseizure headache	Frequent, mild	Frequent, severe
Amnesia after attack	Frequent	Frequent
Postseizure fever	Absent	Frequent, severe

Destruction of the labyrinth and the ganglion of Scarpa, either through the middle ear[13] or through the roof of the petrous bone,[14] has been practiced with apparent benefit.

Walsh and Adson[15] in comparing medical and surgical treatments observed improvement in three groups of patients treated respectively with low sodium diet alone, low sodium diet with ammonium chloride, and low sodium diet with potassium nitrate. They believe that section of the vestibular portion of the eighth nerve is the most effective surgical measure. Such an operation, however, should be advised only after prolonged medical treatment and only if the patient's vocation precludes attacks of vertigo, or if his economic status does not allow loss of time from labor for hospital care or prolonged medical treatment.

The present status of the treatment of vertigo in Ménière's syndrome may be summarized as follows: Patients suffering from vertigo or from Ménière's syndrome should first be managed medically. In every case a thorough search should be made for the primary underlying organic or physiologic mechanisms. These primary mechanisms should be eliminated or alleviated if possible. Fatigue, infection and physiologic and psychic stress should be avoided. Psychotherapeutic encouragement is often effective. Sedation and bed rest during the attacks are indicated. Low sodium diet or a normal diet with potassium chloride may be tried, but the value of these methods of treatment has not yet been established. If after one or preferably two years of carefully conducted medical treatment improvement does not occur, and if the attacks are severe and frequent, surgical treatment may be considered. Surgical intervention, however, is indicated in but a small, selected group.

SYNCOPE

Syncope is a syndrome dependent as a rule on a rather sudden and usually transient ischemic state of the arterial system. Syncope or related states are caused, at times, by vascular reflexes affecting certain cerebral functions. This is the case in the cerebral type

8. Cheatle, A. H.: The Conducting Portion of the Labyrinth, Arch. Otolaryngol. **26**: 185-187, 1897.

9. Frazier, C. H.: Intracranial Division of the Auditory Nerve for Persistent Aural Vertigo, Surg., Gynec. & Obst. **15**: 524-529, 1912.

10. Dandy, W. E.: Pathologic Changes in Ménière's Disease, J. A. M. A. **108**: 931-937 (March 20) 1937; Treatment of So-Called Pseudo-Ménière's Disease, Bull. Johns Hopkins Hosp. **55**: 232-239, 1934.

11. Coleman, C. C., and Lyerly, J. G.: Ménière's Disease: Diagnosis and Treatment, Arch. Neurol. & Psychiat. **29**: 522-537 (March) 1933. Munro, D.: The Surgical Treatment of Certain Repeated Explosive Attacks of Vertigo Occurring in the Absence of Any Demonstrable Etiology—Ménière's Disease, New England J. Med. **216**: 539-551, 1937.

12. Crowe, S. J.: Ménière's Disease: A Study Based on Examinations Made Before and After an Intracranial Division of the Vestibular Nerve, Medicine **17**: 1-36, 1938.

13. Hautant, A.: Indications et résultats éloignés du traitment chirurgical des vertiges auriculaires, Bull. Acad. de méd., Paris **111**: 933-939, 1934. Madison, W. M.: The Operative Treatment of Vertigo, J. Laryng. & Otol. **51**: 38-42, 1936.

14. Putnam, T. J.: Treatment of Recurrent Vertigo (Ménière's Syndrome) by Subtemporal Destruction of the Labyrinth, Arch. Otolaryng. **27**: 161-168, 1938.

15. Walsh, M. N., and Adson, A. W.: Ménière's Syndrome: Medical versus Surgical Treatment, J. A. M. A. **114**: 130-136 (Jan. 13) 1940.

of carotid sinus syncope. Syncope is one type of the shock syndrome.[16] The clinical manifestations of syncope are primarily those of acute cerebral ischemia and anoxia (anoxic syndrome). In the classic instance of syncope there is unconsciousness, at times associated with mild clonic convulsions. In elderly persons convulsions may be a prominent feature in an attack of syncope. If, however, the ischemic state of the central nervous system is mild, light headedness, weakness, dizziness, scintillating scotomas, dimness of vision, "black out," unsteadiness or nausea and vomiting may be the *forme fruste* manifestations. These symptoms may be absent if the underlying physiologic mechanism is set in action with great rapidity. A sensation of rotation, characteristic of vertigo, is usually absent in syncope.

Some persons experience auras that are similar to those occurring before the onset of epileptic fits. As a rule the duration of syncope or syncopal equivalents is less than that of vertigo. In vertigo the duration of the attack is usually measured in hours; in syncope it is measured in minutes. Syncope is dependent primarily on a disturbance of the circulation; vertigo, as already indicated, depends on the disturbance of specific nerve structures and functions.

In most types of syncope the derangement of the circulating blood volume takes place within the cardiovascular system. In a small group of patients, however, hemorrhage is responsible for syncope. Usually either the heart suddenly fails to take care of the inflow of blood (cardiac syncope or acute cardiac shock) or the venous blood flow is rapidly diminished as a result of active or passive dilatation of portions of the vascular bed (vascular syncope). In the shunting or pooling of blood the venous system frequently plays an important role.[17] Among the common causes of syncope are (*a*) nervous conditions (psychogenic factors, pain or other reflexes, structural lesions of the central nervous system), (*b*) gravity, (*c*) chemical factors including anoxia, (*d*) hemorrhage.[18] Although recovery from syncope is the usual course, syncope can be fatal. Because of the importance of gravity in the pooling of blood within the vascular system, to allow the body to remain in an upright or a sitting position during syncope is particularly dangerous. All types of syncope are more prone to occur in the upright, immobile position, and syncopes developing when the body is in a horizontal position are usually of graver significance. For example, in patients with bleeding peptic ulcer, syncope which develops while the patient is resting in bed is indicative of serious internal hemorrhage. In the presence of increased irritability of the cardiac reflexes and of the myocardium such as develops in association with coronary sclerosis, thrombosis or aortic stenosis, and after certain infections such as influenza, streptococcic infections or rheumatic fever; fatal syncope due to asystole or to cardiac irregularities such as ventricular fibrillation or to vagal inhibition with asystole is prone to occur.[19] Whenever death occurs unexpectedly and truly instantaneously, the most probable cause for it is syncope and not acute organic diseases such as cerebrovascular accidents or pulmonary embolism. The onset of pulmonary embolism or fresh coronary infarction can at times be associated with instantaneous death, but it is probable that in these cases the superimposed reflex inhibition of the heart is the immediate cause of death. In the presence of severe organic diseases of the cardiovascular system the same type of syncope is, as a rule, of graver prognostic significance than in normal persons. Whereas in normal persons, owing to the presence of numerous emergency functions and the reserve capacity of the vital organs, a return to normal equilibrium is accomplished with relative ease and promptness; in diseased or aged persons, because organs are damaged and homeostatic capacity limited, a return to the normal level becomes more difficult, is slower and may not occur.

There is an intimate relationship between the fundamental underlying physiologic mechanisms of syncope, collapse and shock. This close relationship is indicated not only by the similarity of the fundamental mechanisms but also by the fact that the same noxious influence, depending on its intensity and duration, can produce syncope, collapse or shock. Thus gastric hemorrhage can be responsible for any of these three syndromes. For the most part the intensity of the stimulus, the time element, the ease of reversibility and the secondary changes in the vessels and tissues are the chief differential features between syncope, collapse and shock.[18] Syncope should be carefully differentiated from attacks of epilepsy, Ménière's syndrome and cataplexy. The differential characteristics of syncope, vertigo and Ménière's syndrome have already been described. The important criteria for the sometimes difficult differential diagnosis to be made between faints (syncopes) and fits (epileptic attacks) are summarized in table 1.

TABLE 2.—*Types of Syncope in Morbid States*

Condition	Type of Syncope
Neurosis, nervous strain	Vasovagal
Mountain sickness	Vasovagal
Infectious diseases	Vasovagal, vagovagal
Menstruation	Vasovagal, carotid sinus
Nutritional deficiencies	Vasovagal, carotid sinus
Organic brain disease (syphilis of the nervous system)	Vasovagal, postural hypotension carotid sinus, vagovagal
Aortic stenosis, mitral stenosis	Mechanical ischemia, vagal asystole (?)
Coronary sclerosis, coronary thrombosis, myocarditis	Vagal asystole, carotid sinus, Adams-Stokes
Hemorrhage	Vasovagal
Chronic anemia	Vasovagal
Acute visceral lesions	Vasovagal, vagovagal
Neoplasm of neck and mediastinum	Carotid sinus, vagovagal
Hyperinsulinism	Vasovagal
Digitalis	Carotid sinus
General anesthesia	Carotid sinus, vagovagal
Local anesthesia	Central type

A classification of the various types of syncope and the details of differentiation have been discussed elsewhere.[20]

In addition to these general considerations, a knowledge of the physiologic mechanisms underlying the

16. Weiss, Soma: Syncope, Collapse and Shock, Proc. Inst. Med. Chicago **13**, number 1, 1940.

17. Weiss, Soma; Wilkins, R. W., and Haynes, F. W.: The Nature of Circulatory Collapse Induced by Sodium Nitrite, J. Clin. Investigation **16**: 73, 1937. Wilkins, R. W.; Haynes, F. W., and Weiss, Soma: The Role of the Venous System in Circulatory Collapse Induced by Sodium Nitrite, J. Clin. Investigation **16**: 85, 1937.

18. Weiss, Soma: Syncope and Related Syndromes, Oxford Medicine, New York, Oxford University Press **2**: 250 (9), 1935.

19. Weiss, Soma: Instantaneous "Physiologic" Death, New England J. Med. **223**: 793-797, 1940.

20. Weiss, Soma: The Interpretation and Treatment of Spells of Unconsciousness in Medical and Surgical Practice, Proc. Inter-State Post Graduate Medical Assembly of North America, 1940, p. 66; Syncope and Related Syndromes.[18]

various types of syncope is essential in the treatment. Table 2 lists the more common types of conditions associated with syncope and the specific types of syncope usually associated with the conditions.

Different types of syncope may require diametrically opposite treatment. Certain general therapeutic principles, however, should always be remembered. In general in most types of syncope, particularly the vasovagal type, in which often psychogenic factors and the upright position play important roles, the attack will usually cease after the body is brought into the horizontal position and the lower extremities are elevated. Persons with a tendency to vasovagal syncope, when standing motionless, should be instructed to maintain rhythmic isometric muscular contractions. Although in the majority of instances of vasovagal syncope vagocardiac inhibitions play some role, experimental evidence indicates that parenteral administration of atropine in doses of 2 to 6 mg.—a dose large enough to depress the vagal influence—does not usually prevent the attacks. Vasovagal syncope can occur, particularly in the upright position, after the administration of vasodilator drugs, such as the nitrites and choline derivatives. To prevent these attacks it is essential to keep the patient in the horizontal position after the administration of the drug. Persons with severe aerophagia can suffer from vasovagal or vagovagal types of syncope caused by the combination of the distention of cardia and esophagus and the psychic factors present. Reeducation of these patients may cure the attacks.

Syncope is prone to occur in the course of infectious diseases if the upright position is assumed. This type of syncope is usually vasovagal in character, and increased distensibility of the minute vessels plays a role. Heightened sensitivity of the heart to vagal inhibition can also be a factor. It is of interest that often the tendency to syncope is greater with a mild upper respiratory infection than after prolonged bed rest of weeks' or months' duration.[21] This is of practical importance particularly in aviation medicine. Aviators should not be allowed to fly at a high altitude when suffering from even a mild respiratory infection.

In attacks of syncope in which vagal inhibition is the primary factor (the cardiac type of carotid sinus syncope and the vagovagal type) doses of atropine (1 to 3 mg.) or tincture of belladonna (1 to 3 cc.) may prevent the occurrence of the attacks. At times, however, toxic side reactions to these drugs interfere with the therapeutic efficacy of these drugs. Epinephrine in hypodermic doses of 0.5 to 1 mg. is effective in the relief or prevention of the vasovagal, the vagovagal, the cardiac or the vascular types of carotid sinus syncope and Adams-Stokes attacks caused by complete dissociation of auricles and ventricles. Digitalis at times enhances the tendency to syncope in patients with heart disease. In some patients with normal sinus rhythm with tendency to Adams-Stokes attacks, ephedrine in oral doses of 30 to 40 mg. every four to six hours may prevent attacks. It has been shown that the efficacy of ephedrine in these patients does not necessarily lie in its ability to prevent the occurrence of the block but rather in its tendency to induce increased irritability of the myocardium. As a result of this hyperirritability when the block occurs an effective idioventricular rhythm develops instantaneously.[22] Barium chloride has been found in my experience to be ineffective in the prevention of Adams-Stokes attacks due to heart block.

Syncopes or equivalent manifestations caused by paroxysmal tachycardias are treated according to the underlying intracardiac disturbances. In the treatment of dizziness or syncope caused by paroxysmal auricular tachycardia the effective measures are usually those which induce prolonged vagal stimulation.[23] Among the simplest of these are pressure on the carotid sinus or on the eyeballs, bending with the head down, rapid swallowing, holding the breath, distention of the stomach with gas liberated from the ingestion of compound effervescent powders, self-induced vomiting, and stretching of the rectal sphincters. Administration of 10 to 20 mg. of morphine or 3 to 5 mg. of apomorphine can be effective. Digitalization, using up to 1 or 1.5 Gm. total dose of the U. S. P. powder, may be indicated. In my experience syrup of ipecac in doses of 4 to 12 cc. is often effective even in obstinate cases. In the prevention of the attack quinine or quinidine in the usual therapeutic doses (0.2 to 0.4 Gm. every four hours) may be effective. Auricular flutter is only rarely responsible for syncope. In these rare instances effective doses of digitalis should be administered. If, following the appearance of auricular fibrillation, spontaneous sinus rhythm does not develop, administration of quinidine in doses of 0.2 to 0.4 Gm. every four hours is indicated. Ventricular tachycardia can be responsible for syncope or equivalent cerebral symptoms, and administration of quinidine or quinine is the measure of choice. In severe or resistant cases intravenous therapy is justified, although the method of treatment is not without danger. Doses of 0.3 to 0.5 Gm. should be administered in 20 cc. solution slowly in the course of fifteen to twenty minutes. Cough, asthma, cyanosis or accentuation of symptoms is an indication for interruption or discontinuation of this therapy. I have seen attacks of ventricular tachycardia lasting for days, which were resistant to various types of treatment until a dose of quinidine sulfate as high as 1 Gm. was given intravenously. In some instances of ventricular tachycardia magnesium sulfate administered intravenously is apparently effective. In a case observed recently, an attack lasted two to three hours and ceased within five minutes after the slow intravenous administration of 3 Gm. of magnesium sulfate in a 50 per cent solution. For the prevention of ventricular tachycardia and ventricular fibrillation caused by coronary thrombosis, routine quinidine therapy has been advocated. It is difficult to evaluate the efficacy of this treatment.

Syncope associated with pleural or pericardial shock often can be prevented by performing surgical manipulation (taps) in the horizontal rather than in the sitting position, by using local anesthesia and by administering atropine before the manipulations. Inflamed surfaces of the pleura are particularly prone to increase the pleural reflexes.

The treatment of syncope caused by orthostatic hypotension is not very satisfactory. It has been shown recently that often this is a manifestation of diseases

21. Weiss, Soma: Unpublished study.

22. Weiss, Soma, and Ferris, E. B., Jr.: Adams-Stokes Syndrome with Transient Complete Heart Block of Vagovagal Reflex Origin: Mechanism and Treatment, Arch. Int. Med. 54:931 (Dec.) 1934.

23. Weiss, Soma, and Sprague, H. B.: Vagal Reflex Irritability and the Treatment of Paroxysmal Auricular Tachycardia with Ipecac, Am. J. M. Sc. 194:53, 1937.

of the sympathetic nervous system in which hydrostatic pressure plays an important role.[24] In patients with syphilitic diseases of the nervous system, particularly dementia paralytica and tabes, syncope is caused by orthostatic hypotension. Some of these patients have an increased tendency to syncope and collapse during fever therapy. The morning dizziness or syncope of the aged may be caused by a tendency to orthostatic hypotension at that time of day. This and other types of orthostatic hypotension may improve as the day goes on. In the less severe cases, such as occur in the aged, mild morning exercise and a cup of tea in bed one half to one hour before getting up may be effective. Ephedrine sulfate in doses of 25 to 50 mg. or paredrinol (α-N-dimethyl-p-hydroxyphenethylamine) and presumably paredrine in doses of 10 to 20 mg. intramuscularly are also helpful. In addition to these measures, bandaging of the extremities and abdominal binders may help.

The treatment of syncope associated with toxic reactions caused by local anesthetics consists of treatment of the poisoning caused by the drug. In the prevention of these toxic reactions administration of barbiturates in doses of 0.2 Gm. of phenobarbital, pentobarbital or amytal is effective. Syncope associated with hemorrhage or severe anemia should be treated specifically with transfusions of blood or proper blood substitutes (plasma or albumin solutions), or with specific measures for the treatment of chronic anemias (iron and liver extracts). Hypoglycemic reactions can be responsible at times for syncope. In these cases administration of dextrose, avoidance of overdoses of insulin or surgical removal of the adenoma of the islands of Langerhans or of other neoplasms of the glands of internal secretion are the effective therapeutic measures. There are patients suffering from angina pectoris who, with some or all of their attacks of angina, develop syncope (syncope anginosa) or milder manifestation. The drugs effective in the prevention of angina will also prevent the fainting or cerebral ischemia. If the patient is receiving digitalis, this should be discontinued. Rarely patients with advanced ("fishmouth") mitral stenosis or congenital heart disease suffer from syncope or milder equivalent symptoms on exertion. As this type of syncope depends on inadequate cardiac output caused by mechanical impediment, avoidance of physical stress is the only preventive measure available. The syncope associated with aortic stenosis is usually associated with bradycardia, but the exact nature of this type of syncope is not known at present. In instances of carotid sinus syncope, particularly in the cerebral type, which do not yield to simple measures which prevent mechanical stimulation of the sinus or to specific medication, surgical denervation of the sinus is indicated.[25] Rarely surgical removal of irritating structures which are responsible for reflex syncope may cure the patient.[22]

Thus it will be seen that the treatment of syncope depends on the underlying etiology and physiologic mechanism. In each case effective therapy can be undertaken only after the pathogenic factors have been elicited.

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24. Ellis, L. B., and Haynes, Florence W.: Postural Hypotension with Particular Reference to Its Occurrence in Disease of the Central Nervous System, Arch. Int. Med. **58**: 773-798 (Nov.) 1936. Stead, E. A., Jr., and Ebert, R. V.: Postural Hypotension, a Disease of the Sympathetic Nervous System, ibid. **67**: 546-562 (March) 1941.

25. Weiss, Soma, and Baker, J. P.: The Carotid Sinus Reflex in Health and Disease: Its Role in the Causation of Fainting and Convulsions, Medicine **12**: 297, 1933. Ferris, E. B., Jr.; Cappe, R. B., and Weiss, Soma: Carotid Sinus Syncope and Its Bearing on the Mechanism of the Unconscious State and Convulsions, Medicine **14**: 377, 1935.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

SIMPLE WORKABLE RESPIRATOR

An epidemic of poliomyelitis of major proportions struck the Northern peninsula of Michigan in the fall of 1940. Within a period of a few days 90 patients were rushed by train, by automobile and even by airplane into St. Luke's Hospital at Marquette, Mich. The respiratory type of paralysis was unusually prevalent among the affected children. Only one respirator was available, and at least 12 children needed assistance.

The superintendent of St. Luke's Hospital appealed to Mr. M. K. Reynolds, one of the trustees, for help, insisting that with his engineering ability he surely could devise some type of temporary respirators that could meet the problem until regular respirators could be obtained. The machine shop which Mr. Reynolds maintained at his private boat yard immediately was turned into a respirator laboratory. Cabinet makers and machinists were called in and within a few hours crude but workable respirators were delivered to the hospital. Their first homemade respirator consisted of two gasoline drums welded together and fitted with a hand manipulated valve; this apparatus was attached by a hose to the one available large respirator as a "trailer." Two children were placed in this "trailer," and women of the community worked the valve by hand constantly for thirty-six hours, or until a mechanical automatic valve was constructed. The thrilling story of this volunteer community effort to meet the respiratory problem when commercial respirators were not available was published in the December 1940 issue of *Hygeia*.

Since that article was published, Mr. Reynolds has received numerous letters and many personal visits from representatives of remote communities where poliomyelitis has broken out and where the respiratory problem has become as acute as it was in Marquette. For example, an epidemic has been raging in Alaska. Respirators were needed. An appeal came to Mr. Reynolds and he sent photographs and working plans for making this simple wooden respirator which had proved so valuable in the Marquette epidemic. In his opinion these respirators could be made within a few hours in any school manual training shop, should the emergency arise.

That there is a great need for emergency respirators was recognized by Drs. Phillip Drinker and Edgar Roy, who published specifications for making such an apparatus in the *Journal of Pediatrics* (**13**:71 [July] 1938). This need is also evident from the urgent requests which have come to the office of the Council during the past year from various parts of the country asking for information as to the location of available respirators. The National Foundation for Infantile Paralysis on July 1, 1941 published a complete list of respirators, giving locations and owners, which may be obtained from the foundation at 120 Broadway, New York City.

It has long been recognized that the need for respirators arises in time of great emergency and that commercial respirators are not always available when needed. Furthermore, a simple respirator such as this should prove useful for intermittent home use to a limited number of badly paralyzed patients who have been hospitalized for many months. Since the respirator can be built cheaply, it can meet an economic problem heretofore almost unsurmountable for patients who require prolonged assistance of a respirator.

Mr. M. K. Reynolds has given to the Council on Physical Therapy a complete set of drawings with instructions for building this simple workable respirator. A pamphlet which graphically sets forth its construction has been prepared and is available for distribution on application to the Council on Physical Therapy of the American Medical Association. This pamphlet should enable any community far removed from a supply of commercial respirators to build this life saving device.

The Council on Physical Therapy has reviewed the plans for making this simple wooden respirator and has authorized the publication of this pamphlet. We feel that Mr. Reynold's gift to humanity merits the gratitude of the entire profession.

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SATURDAY, FEBRUARY 14, 1942

DOCTORS' DOLLARS FOR BONDS

Since "Jap Sunday" this nation has been resolute for total victory. In this war physicians will play multiple roles. Through the Procurement and Assignment Service every physician will have opportunity to contribute services to the armed forces or to the care of civilians. Most physicians who serve the armed forces do so at a considerable financial sacrifice. Physicians who remain at home may also contribute by lending money to the government to pay for the tools of war.

To the largest possible extent it is the announced policy of our government today to pay as we go. This means that each year as much as possible of the annual cost of the war effort will be paid out of taxes. The President has asked that funds from the various taxes be increased during the next year by $9,000,000,000. But the tax total will not be sufficient to meet the cost of the war effort. To obtain the money to push the war effort to the maximum, the Treasury has asked every earner to lend dollars to the government through the defense savings program. The purchase of a bond makes the buyer an active helper in the country's effort. Moreover, money put into defense bonds helps to curb inflation.

As an accepted leader in the community the physician may do much to aid the sale of defense bonds. Each person who buys a bond or a stamp regularly builds himself a personal financial reserve just as good as cash in the bank. Such reserves will help take care of any emergency need, in health or in illness, and will serve as security for the distant future. This is the American way; the individual assumes in large measure responsibility for himself.

There are three series of defense savings bonds, known as E, F and G. Each is designed to meet a different sort of buyer, with a different kind of need. Series E bonds are the "people's bonds." They may be bought only by individuals in their own rights and are cut to fit all sizes of pocketbooks with a limit on holdings of $5,000 maturity value of bonds issued in one calendar year. The people's bonds are appreciation bonds which cost 75 per cent of their face value, and the government pays back the full amount at the end of ten years. The 33⅓ per cent increase is equivalent to an annual return of 2.9 per cent compounded semiannually. They may be registered in the names of one or two persons or in the name of one person with a second listed as beneficiary. To protect the buyer of a bond, it is made so that he cannot sell it or use it as security for a loan, but he may redeem it any time after sixty days from the date of issue. The smallest of the people's bonds costs $18.75. But this is not the smallest amount that can be put into defense savings. Smaller amounts of money purchase savings stamps, which can be bought for as little as 10 cents. Money invested in stamps does not bring interest, but $18.75 in stamps can be turned in for one of the registered interest bearing bonds. Nearly every post office in the nation has a bond and stamp window. Nearly every national and state bank in the United States has bonds for sale. Tens of thousands of retail stores have stamps.

The F and G bonds are largely for associations, corporations and other large investors. Formerly the smallest series F bond cost $74, but the demand from organizations for a smaller denomination bond has been so great that now the Treasury is offering a $25 series F bond which costs $18.75. The bonds of series F are purchased for 74 per cent of their face value and at the end of the twelve year maturity period provide a return equivalent to an annual interest rate of 2.53 per cent compounded semiannually. F and G bonds are redeemable by the owner on one month's notice after six months of the issue date of the bond. The owner is limited to $50,000 (cost price) of series F bonds alone or in combination with series G bonds originally issued to such owner in any one calendar year.

Series G bonds are intended for those who wish to receive a current income from their investment. Their cost is the same as their face value, and they are issued in denominations from $100 to $10,000. These bonds mature twelve years from the date of issue, and interest is payable semiannually at the rate of 2.5 per cent if carried through to maturity.

Although bonds of series F and G are issued only by Federal Reserve banks and the Treasury Department, commercial banks generally will handle applications for them.

The physicians of America have never refused responsibilities placed on them in time of war. They are responding now to every demand. They may be counted on to do their full share in the defense savings program.

HOW TO RELAX

"If we could learn how to balance rest against effort, calmness against strain, quiet against turmoil," says Dr. Josephine Rathbone, "we would assure ourselves of joy in living and pyschophysical health for life." The psychologists believe that people who live dynamically without being too tense have four main attributes: first, rhythm in their activities with great swings in output and accomplishment, alternating with periods of repose; second, a sense of values which makes it possible to minimize effort and minimize strain; third, ability to reduce muscular tension in any part of the body consciously whenever desired, and, fourth, a readiness to fall asleep at will.

While these attributes may develop spontaneously to some extent in some persons, it is also possible to cultivate them in a measure. In order to aid such cultivation, ten tricks are presented which are believed to be useful in realizing relaxation. They are:

1. Cut down on the intensity of your thinking half an hour before retiring. (Play Chinese checkers, plan an excursion for the week end, write a letter to a friend, fill with pleasant things you have been doing.)

2. Take plenty of time to get ready for bed (next morning's clothes, leisurely bath, and so on).

3. If you like to read in bed choose nonfiction or a "hard" book. Force your mind to grapple with cumbersome facts, bore it into unconditional surrender to sleep.

4. Transplant your mind from fears or hates to a field which has interest without excitement (a new wardrobe, possibly).

5. Make your mind hop from one idea to another. Just as the mind loses consciousness and sleep comes, thoughts become disjointed and scattered. (Start with some happy episode in childhood, for example.)

6. To quiet the body, get rid of any pressure or pain. (Lighten weight of covers, clothes.)

7. Tepid bath without a rubdown. (Get into bed a little damp and chilly. As the body becomes warmed it becomes more and more comfortable. If during the night one becomes sleepless, throw back covers until body becomes uncomfortably chilly. Then when the covers are pulled up again, the body once more sinks into coziness.)

8. Imitate the slow, deep rhythmical breathing of sleep. (Helps regulate the circulation and may ease the mind and emotions; also tensions in the abdomen.)

9. Relax the muscles completely.

10. Get rested before trying to sleep. (Get into bed an hour or more before your regular time for retiring. Do so night after night to build up a reserve of rest and fall asleep without the old struggle.)

The balance between what can be accomplished by education and practice and what is innate in producing relaxation and longevity is a delicate one. Physicians have long known that people with a low blood pressure, a low basal metabolic rate, a low pulse rate and a low intake of food—if all of these are not too low—tend to live longer than those in whom these physical factors are at extremely high levels. Perhaps equally important is a low threshold for the sense of humor—a mental attitude which does not take life too seriously.

NEW AIDS IN THE DIAGNOSIS OF LYMPHOGRANULOMA VENEREUM

The possibility of widespread latent infection with lymphogranuloma venereum in this and other countries has been recognized since the Frei test came into more general use. Many persons under observation for other venereal diseases repeatedly have been found with a positive test for this disease. Frei[1] refers to nine papers published before 1936, all mentioning the existence of latent lymphogranuloma venereum in normal persons and in prostitutes. In all those studied the latent infection was indicated by positive Frei tests. Singularly, in many of the so-called normal persons with a positive test a record of infection with lymphogranuloma venereum was lacking. Clinical evidence also is available indicating that other obscure conditions, particularly of the lower bowel, may be related to lymphogranuloma venereum; this fact is emphasized by the paper of Palmer, Kirsner and Rodaniche in this issue of THE JOURNAL, page 517.

During the past year the Squibb Institute for Medical Research, collaborating with workers[2] from Long Island College of Medicine, has developed methods which offer promise for a more refined study of lymphogranuloma venereum. The Frei antigen, as first described, consisted of sterile pus from an unruptured bubo in a person without history or evidence of other venereal disease. The original antigen has disadvantages. There were few cases free from evidence of other venereal diseases which have buboes without secondary bacterial infection; even then the amount of pus in such buboes is small and its potency varies with the individual. Numerous unsuccessful studies have been made to discover other sources of Frei antigen. These investigators and their associates have demonstrated that the virus of lymphogranuloma venereum can be propagated in large amounts when inoculated into the yolk sac of the developing chick embryo. The virus thus propagated can be separated readily from much of the yolk and tissue components by differ-

1. Frei, Wilhelm: On the Skin Test in Lymphogranuloma Inguinale: A Brief Review and a Discussion of Some Possible Causes of Error, J. Invest. Dermat. **1**: 367 (Oct.) 1938.

2. Rake, Geoffrey, and others: New Aids in the Diagnosis of Lymphogranuloma Venereum, Am. J. Syph., Gonor. & Ven. Dis. **25**: 687 (Nov.) 1941.

ential centrifugation. This discovery has not only made possible the production of a large amount of the virus of lymphogranuloma venereum for experimental and clinical use but has led to the hope that an antigen could be produced for a successful complement fixation test for diagnostic use.

The new yolk sac antigen is prepared by liberation of the virus from the cells of the yolk sacs by grinding with abrasion, and suspending the material in saline solution; by separation of the virus from the yolk sac constituents by differential centrifugation and dilution of the final virus-containing sediment in saline solution to a volume two hundred or more times that of the original yolk sacs, and then by inactivating the virus by addition of solution of formaldehyde and phenol to final concentrations of 0.1 per cent and 0.25 per cent, respectively; sterility tests are then made in suitable culture mediums and in the yolk sacs of normal eggs. This antigen has been used successfully in the intradermal Frei test carried out in the usual way with 0.1 cc. of the antigen and read forty-eight or seventy-two hours after inoculation. These observers found that the antigen can be employed satisfactorily in the Frei intradermal test, that it was more sensitive than mouse brain antigen and that it has little power to sensitize patients to the antigen or to egg products. Most of the many investigators who have tried to develop a complement fixation test for lymphogranuloma venereum have failed to demonstrate a specific reaction. The present investigators and their collaborators,[2] using the yolk sac antigen, have successfully demonstrated complement fixing properties in the serum of infected patients. The complement fixation test as used by them was notable for simplicity and rapidity of performance. Although overnight fixation in the refrigerator results in slightly higher titers for "positive" serums, this time consuming refinement is not necessary. A specimen of serum submitted for the Wassermann test can be employed equally well in the test for lymphogranuloma venereum. There is no necessity for the patient to return a second time as is the case in the reading of the Frei test. Extensive observations made during this study in a case of accidental laboratory infection suggest that complement fixing properties may appear in the serum within a week after the onset of symptoms. In this case the Frei test became negative after chemotherapy, while the serum still showed specific complement fixation. In fact all the indications obtained by these workers were to the effect that the test is more delicate than the Frei test in detecting borderline cases. The test may prove useful in epidemiologic surveys to determine the incidence of lymphogranuloma venereum among the general population.

Current Comment

DOCTORS FOR BRITAIN

With the entrance of the United States into World War II, our project to aid Great Britain by supplying medical volunteers for the British emergency medical service and also for the British army came to an end. It is understood that American physicians in Britain will be given the opportunity to join the American forces. Among the physicians sent to Britain were twelve women who, it is understood, will continue their work in Great Britain. The total number of physicians sent to Great Britain in this project was well under one hundred. The American Red Cross and the British Red Cross have expressed appreciation of the efforts of the medical profession to aid them in securing such medical personnel as they were able to secure in this way.

EMERGENCY RESPIRATOR

When an epidemic of poliomyelitis strikes suddenly, medical and hospital facilities are sometimes inadequate to cope with the situation. Especially is this true when extra respirators are urgently needed. Hospital authorities who wish to serve their communities efficiently are nevertheless confronted with the perplexing decision as to whether or not an investment supplies facilities whose use justifies their cost. Some hospitals cannot afford to purchase a commercial respirator; other institutions may have one or possibly two respirators lying idle in the store room most of the time. Often during epidemics ten times the available local supply of respirators may be demanded. The National Foundation for Infantile Paralysis has published a list of respirators giving the location of owners; the headquarters of the foundation is glad to assist in supplying respirators for emergencies. Even with this assistance, the urgent need for respirators may not be satisfied. One community in the northern peninsula of Michigan solved the problem by constructing home made respirators from material commonly found in a carpentry or machine shop. Elsewhere in this issue of THE JOURNAL, in a report of the Council on Physical Therapy, additional information on emergency respirators is given. To conserve space, detailed specifications for construction are not published in THE JOURNAL, but they may be obtained for 10 cents by writing to the office of the Council on Physical Therapy at the American Medical Association in Chicago and requesting the pamphlet entitled "Simple Workable Respirators." Hospital authorities finding their budgets strained to the limit will welcome this information. Other institutions already equipped with respirators may wish to have the specifications in their files in case of emergency. These plans may be turned over to the maintenance department or the house carpenter for study, so that the person in charge will be familiar with them should an emergency arise. These home made respirators are not designed to take the place of efficient commercial acceptable respirators on the market but are offered as a means of tiding over an institution until more permanent equipment is made available.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

AN OPEN LETTER TO THE MEDICAL PROFESSION

The Office of the Procurement and Assignment Service has been flooded with thousands of enrolment forms and letters of inquiry. Present conditions make it impossible to acknowledge the receipt of enrolment forms or to answer the questions individually.

The office has been moved to 601 Pennsylvania Avenue N.W., Washington, D. C. Sufficient clerical assistants are difficult to obtain at this time.

All letters have been given personal attention and the questions have been clarified. The Committee on Information is preparing an article which should answer most questions. This will be ready for release in the very near future (probably February 21.—ED.). This committee is also preparing a complete pamphlet of information on the organization, functions and activities of the Procurement and Assignment Service.

Many thousand enrolment forms have been processed; those who have volunteered for immediate service in the Army or the Navy will receive application blanks to be completed with a view of commission at an early date. The major portion of the time of this office is required for this purpose.

I would like to ask that all inquirers be patient with the thought that they will receive the answers to their questions and that the continued releases from this office will serve to keep them up to date. This should reduce materially the amount of correspondence. In this way the office will be relieved to the extent that it can provide personnel for the armed forces to meet the immediately expanding needs.

Questionnaires have been drawn up and enrolment forms are now being printed. These will be mailed to every physician, dentist and veterinarian within the near future. All information at hand as a result of previous questionnaires is being utilized. The additional data and the enrolment will serve to meet the future needs of the armed services and the governmental, industrial and civilian agencies which will require assistance.

I wish to express the appreciation of the Directing Board for the cooperation of the physicians, dentists and veterinarians which has made it possible for us to meet the military needs in such a short period of time.

MAJOR SAM F. SEELEY, M. C., U. S. Army.
Executive Officer, Procurement and Assignment Service.

CHICAGO ORGANIZES EMERGENCY MEDICAL SERVICE

The Emergency Medical Service of the Office of Civilian Defense for the Chicago Metropolitan Area has completed its organization and now is functioning, Mayor Edward J. Kelly of Chicago, Metropolitan Coordinator, has announced. Dr. Herman N. Bundesen is chief of Emergency Medical Service and chairman of the Executive Committee of the Medical Advisory Council. Dr. Morris Fishbein is vice chairman of the Executive Committee. Other members are Dr. Raymond B. Allen, Dr. John S. Coulter, Mr. Joseph H. King and Dr. Malcolm T. MacEachern.

The chairmen of the various divisions of the Medical Advisory Council are as follows: Mr. King, Ambulance and Emergency Transportation; Dr. Sidney O. Levinson, Blood Transfusion and Blood Banks; Mr. O. U. Sisson, Drugs, Supplies and Equipment; Dr. Loyal Davis, First Aid Posts and Casualty Stations; Dr. MacEachern, Hospitals and Clinics; Dr. Harry E. Mock Sr., Health of Industrial Workers; Dr. Irving S. Cutter, Information; Miss Ada R. Crocker, R.N., Nurses' Aides; Mrs. Anna M. Fishbein, Nursing Care, Health of Women and Nutrition; Dr. H. Prather Saunders, Physicians; Dr. Walter H. Theobald, Shelters, Public Health and Morale, and Dr. James P. Simonds, Water Supplies.

As an example of the extent of the medical protection already created for the Chicago Metropolitan Area, the announcement says, in the event of an emergency ten thousand people from any one of the twenty-two zones established in the Metropolitan Area can be moved to a hospital within sixty minutes. An inventory of hospital facilities, equipment and personnel has been completed and emergency medical field units have been established in practically all of the approved hospitals. First aid posts have been designated and the training of nurses' aides, under way for some time, is being constantly expanded. An inventory of supplies and necessary drugs in the Metropolitan Area is rapidly nearing completion, and four thousand drug stores in the area are available for supplying information to the public on the location of the nearest air raid shelters and medical facilities in the event of an emergency.

Steps have been taken for the safeguarding of the water supply in the area, both civilian and industrial, against contamination. These precautions involve not only the guarding of the sources of water supply but also such vital moves as the insuring of an adequate reserve supply of chlorine for the purifying of the water.

A survey is rapidly nearing completion of the day nurseries in the Metropolitan Area so that the Medical Advisory Council will be able adequately to take care of the children of employed mothers while they are at work.

A roster of physicians to man all the various medical operations of the Emergency Medical Service has been completed.

A miniature model casualty station to show the public how this phase of Emergency Medical Service will function, in the event of an emergency, is being made by Mrs. James Ward Thorne, noted miniaturist, and will be placed in the Museum of Science and Industry. The announcement says this will be the first model of its kind in the country.

It was announced that the following statement has been made by Dr. George Baehr, Chief Medical Officer of Civilian Defense, Washington, D. C.: "The recommendation of the United States Office of Civilian Defense has been adapted to the needs of

Metropolitan Chicago in so comprehensive a manner that the plans of the Medical Advisory Council of Chicago Metropolitan Civilian Defense Area may be accepted as a pattern for other large cities in the Middle West."

GENERAL HOSPITALS ORDERED INTO SERVICE

Present indications point to the activation of a number of reserve affiliated hospital units in the near future. The War Department has already ordered the activation of the Fourth, Fifth and Twenty-First Reserve General Hospitals and has ordered the Fifty-Second Evacuation Hospital to active duty. The Fourth General Hospital was organized by Western Reserve University Medical School, Cleveland, and has been ordered to active duty; the Fifth General Hospital by Harvard Medical School; the Twenty-First General Hospital by Washington University School of Medicine, St. Louis, and the Fifty-Second Evacuation Hospital was organized at Pennsylvania Hospital, Philadelphia. These units are made up of physicians and nurses serving at these hospitals; the officers have all been members of the medical reserve corps, while the nurses have been registered with the American Red Cross. Most of these units saw service in World War No. 1, at which time they were organized and equipped by the Red Cross, while now they are under the direct supervision of the Surgeon General of the Army as to organization and equipment.

CALL FOR BLOOD DONORS FOR THE ARMY

Although the army and navy forces in war areas now have blood plasma collected by the American Red Cross, even larger donations must be made if our forces are to be fully supplied with blood. Supplies of plasma have been delivered to the army and navy posts in the various Atlantic bases, the Philippines and throughout the Far East war area through the donations obtained by the American Red Cross. Col. Charles C. Hillman of the Surgeon General's Office, Washington, D. C., issued an urgent call on January 25 for additional blood donors. During the week of December 7 5,000 pints of blood in this country was volunteered in comparison with an average of about 1,000 pints during the period preceding the attack on Pearl Harbor. The goal of the Red Cross is to supply enough blood plasma not only for the army and navy but for civilian needs as well. The Red Cross has facilities already set up for the handling of hundreds of thousands of blood donations, and campaigns are under way to enroll additional civilian donors in sixteen of our largest cities.

CIVILIAN DEFENSE MEDICAL OFFICERS ON FIELD DUTY

Six medical officers have been appointed to Regional Offices of Civilian Defense to assist state and local defense councils in organizing Emergency Medical Service and carrying out the training and educational programs of the Medical Division. They have been commissioned as Senior Surgeons in the U. S. Public Health Service Reserve.

Dr. Allan M. Butler, First Civilian Defense Region, 101 Milk St., Boston, Mass.

Dr. H. Van Zile Hyde, Second Civilian Defense Region, 111 Eighth Ave., New York, N. Y.

Dr. W. Ross Cameron, Third Civilian Defense Region, 400 Cathedral St., Baltimore, Md.

Dr. William S. Keller, Fifth Civilian Defense Region, 427 Cleveland Ave., Columbus, Ohio.

Dr. W. Booth Russ, Eighth Civilian Defense Region, Majestic Bldg., San Antonio, Texas.

Dr. Wallace Hunt, Ninth Civilian Defense Region, 233 Sansome St., San Francisco, Calif.

CIVILIAN PROTECTION AREAS IN ILLINOIS

The chairman of the civil protection division of the Illinois state council of defense has announced the boundaries of the nine regions into which the state is to be organized for civil protection. The region boundaries in general follow the boundaries which have been fixed already for the state highway police operations. They have been subdivided into thirty-five warning districts, which vary in size according to the density of the population and of the industries within them. The plan provides that every rural section comprising 6 square miles will have an observation post and every town of two thousand five hundred or more population will have a report center. The chairman, Mr. William F. Waugh, announced the appointments of the liaison officers and others in the various regions.

SOUTH CAROLINA ORGANIZES EMERGENCY SERVICE UNITS

Representatives of every county in South Carolina met in Columbia on December 30 to plan the organization of emergency medical service units. The chief medical officer of the medical division of the South Carolina Council for National Defense, Dr. H. Grady Callison, presided. Among the speakers were Major G. Heyward Mahon, director of the South Carolina Council for National Defense; Lieut. Col. Ragnar E. Johnson, chemical officer at Fort Jackson; Dr. Floyd Rodgers, Columbia; Dr. Robert Wilson, Charleston; Dr. C. O. Bates, Greenville, and Dr. James A. Hayne, Columbia, state health officer. Among those present were medical officers for each of the eight medical districts of the state and the various county chief medical officers, as well as members of the state board of health, Drs. George Truluck and Dr. Thomas A. Pitts, president and president-elect, respectively, of the South Carolina Medical Association.

STUDENTS ENLISTING IN CLASS V-1, U. S. NAVAL RESERVE

Effective immediately, students in school or college who have not yet reached their twentieth birthday may enlist in class V-1 of the U. S. Naval Reserve and, on their own request, may be placed on inactive duty until the completion of the current scholastic year unless the military situation necessitates the Navy Department's calling them to active duty beforehand, Rear Admiral Randall Jacobs, U. S. Navy, Chief of the Bureau of Navigation, announced on January 22. Schools and colleges will be encouraged to give extra physical training and studies to young men who enlist in this category during the next four months as recommended by the Bureau of Navigation. The commandants of all naval districts have been directed not to call any of these men to active duty until orders have been issued by the Bureau of Navigation. In announcing the new opportunities for students, Rear Admiral Jacobs stated that naval recruiting will continue on a voluntary basis.

CONSULTANTS IN MEDICAL AND DRUG SUPPLIES

Dr. Robert P. Fischelis, chief chemist of the New Jersey Board of Pharmacy, member of the New Jersey Board of Health, has been released from those duties in order to give part time service as chief of the section of Medical and Health Supplies of the Civilian Supply Division of the War Production Board in Washington. Dr. Fischelis will organize a staff of consultants and specialists in hospital, medical and drug supplies. Their function will be to study civilian needs and plan for the allocation of health and medical supplies; also the problem of replacing drugs derived from foreign sources and now not available, and the possible replacement of certain drugs derived from scarce materials with drugs of similar therapeutic action derived from more plentiful sources.

ORTHOPEDIC MECHANIC POSITIONS OPEN

An examination has been announced by the Federal Civil Service Commission to secure orthopedic mechanics for the Army services. The salary is $2,000 a year. Persons may qualify under the following optional subjects: (1) general, (2) bracemaker, (3) shoemaker and leatherworker and (4) limbmaker. Because of the demand for qualified eligibles, applications will be accepted at the Civil Service Commission's Washington office until further public notice.

Persons appointed will construct, design, alter and repair orthopedic appliances as indicated by the optional subjects. This includes working from living models and plaster casts, doing nickel plating, and shaping, grinding and polishing metals used in orthopedic appliances.

Applicants will not take a written test but will be rated on the extent and quality of their experience. They must have had five years of appropriate experience in orthopedic work within the past ten years. Under the option "shoemaker and leatherworker," persons whose experience has been in general shoe repair will not be considered qualified.

Examination announcements and application forms may be obtained at first and second class post offices and from the Civil Service Commission, Washington, D. C.

SOLDIERS' IDENTIFICATION TAGS

The War Department has revealed that the new identification tag worn by United States soldiers carries besides the soldier's name and serial number the name and address of the person to be notified in case of emergency, his religion, the date on which tetanus immunization was completed and his blood type. The present identification tag is made of stainless and rustproof monel metal, instead of aluminum as it was in the first World War; aluminum sometimes deteriorates as a result of chemicals and acids encountered on the battlefield. The present tag is 2 inches long, 1⅛ inches wide and $^{25}/_{1,000}$ inch thick, with rounded corners.

AMBULANCES PRESENTED TO PHILADELPHIA

On behalf of the British American Ambulance Corps its president, Mr. William V. C. Ruxton, presented two ambulances on Dec. 18, 1941 to the mayor of Philadelphia for service with the mayor's civilian defense committee. The British American Ambulance Corps also presented two four stretcher ambulances to the city of San Francisco at the request of Mayor Angelo J. Rossi; these ambulances left New York on December 15. The British American Ambulance Corps is an American organization founded to relieve suffering and for months has sent to the British various urgently needed supplies. Now the ambulance corps is also actively engaged in defense work and the supplying of such needs of the American armies. The corps has sent ambulances to training camps in the United States and to newly acquired naval bases in Newfoundland and Iceland.

DEEP RED LIGHT BETTER THAN BLUE IN BLACKOUTS

Extensive experimentation by the army engineer corps reveals, the War Department announced on January 16, that a deep red light is much more satisfactory than the widely accepted blue light. Blue is more easily observed from the air than deep red, which also gives better illumination on the ground and aids the eyes to become adapted to the darkness. The disadvantage of using deep red, the announcement said, is the possibility of confusion with tail lights on motor vehicles; furthermore, since red illumination is not normal, it may, if not properly used, betray the installation which is to be concealed. All things considered, properly hooded low intensity white light is more generally applicable to blackout illumination problems than colored illumination.

CLEVELAND'S LAKESIDE UNIT ON ACTIVE SERVICE

The medical officers of U. S. Army General Hospital No. 4 left Cleveland on January 10 for active military service. The unit comprises physicians from Lakeside Hospital, City Hospital and other hospitals of Cleveland associated with Western Reserve University Medical School. The unit retains the number of its predecessor, which served in World War No. 1 with distinction at Rouen, France. Like the former hospital, which, the *Bulletin* of the Academy of Medicine of Cleveland says, was the first detachment of the American Expeditionary Forces to arrive in France, the present unit responded to the early call to military duty. When the entire personnel of the Lakeside Unit is assembled, it will number several hundred, including about fifty physicians, one hundred and twenty nurses, technicians, orderlies and cooks. The commanding officer is Col. William L. Starnes of the regular army medical corps; chief of the medical service is Lieut. Col. Joseph M. Hayman, professor of clinical medicine and therapeutics at Western Reserve University School of Medicine; the chief of the surgical service is Lieut. Col. William C. McCally, assistant clinical professor of surgery at Western Reserve. The head of the nursing staff is Miss Olga Benderoff, assistant director of nursing at University Hospitals, Cleveland. Seventy-two nurses assigned to Army Base Hospital No. 4 left Cleveland on January 19 en route to join the unit. The following additional physicians are members of the unit:

Surgical Service: Majors David A. Chambers, Donald M. Glover, James J. Joelson, John H. Lazzari and Wilbert H. McGaw. Capts. Sidney E. Blandford, Paul W. Gebauer, William Gernon, Carl A. Hamann, Donald A. Kelly, John J. Thornton, Vladimir L. Tichy, Elden C. Weckesser, Webb P. Chamberlain Jr. and Charles W. Elkins. First Lieuts. Cleon C. Couch, William W. Markley, Elmer P. Maurer, Ralph E. Gray and Valdemar M. Jordan.

Medical Service: Majors R. O. Egeberg, William R. Hallaran, Edward O. Harper, Boyd G. King, William A. Read, Ralph L. Cox and Irwin Clay Hanger. Capts. Paul M. Glenn, Leo Walzer, Graham T. Webster, Walter M. Solomon, Frank M. McDonald, David R. Weir, L. H. Bronson and L. P. Longley. First Lieuts. James H. Donnelly, John P. Eichhorn, John R. McKay and Karl Rundell.

Laboratory Service: Major William B. Wartman, Capt. Joseph R. Kahn and First Lieut. H. H. Johnson.

Dental Corps: Capt. Henry J. Toomey and First Lieuts. Homer V. Briggle, Joseph W. Foltz, Anthony J. Tomaro, John E. McNally and Edward Ferreri.

Roentgenologic Service: Major Eugene Freedman, Capt. Joseph L. Morton and First Lieut. Isadore Meschan.

Administrative Service: Major Guy Brugler.

UNDERGRADUATE DEFENSE PROGRAM IN TRAINING NURSES

A three year undergraduate defense program for training student nurses in nine cooperating and affiliate schools is being administered by Wayne University, Detroit, with a $48,690 fund granted to the university by the government. Miss Eleanor King, former instructor in nursing at Yale University and the University of California, has been named assistant coordinator of the three year program. The coordinator, Miss Louise Alfsen and Miss Eleanor King will give special attention to the training of nurses in communicable diseases and surgical and medical procedures.

MEDICAL AID FOR RUSSIA

The Springfield, Mass., Committee for Russian War Relief announced on January 22 through headquarters of Russian War Relief, Inc., 535 Fifth Avenue, New York, that Dr. Garry DeN. Hough Jr. of Springfield will head a group of medical men aiding the committee in its effort to get medical supplies to Russia; others in the group are Drs. Harold F. Budington, William A. R. Chapin, James B. Comins, Arthur E. F. Edgelow, Frederick S. Hopkins, Edward Katz, Roswell G. Mace, Oliver J. Menard, Mendel Poliak, Bernard Rabinovitz, Walter W. Williams, Charles F. Lynch, Joseph P. Derby and Salvatore Sannella.

EVACUATION HOSPITALS CALLED TO ACTIVE DUTY

The second and seventh evacuation hospitals have been called into active duty. The second, from St. Luke's Hospital, New York, reported to Fort Devens, Mass., and the seventh evacuation hospital from New York Post-Graduate Hospital, New York, was ordered to Fort Dix, N. J. The commanding officers of the two hospitals are Lieut. Col. William F. MacFee, M.D., and Lieut. Col. Robert S. Lobban, M.D., respectively.

MEDICAL SERVICE ON THE BURMA ROAD

According to the Christian Medical Council for Overseas Work, 156 Fifth Avenue, New York, the Quakers have provided the Burma Road in China with a modern medical service with Dr. Robert B. McClure in charge and Dr. Henry L. Louderbough and "Dr. Boyd from India" on the staff. About fifty young Englishmen act as chauffeurs. Trucks sent from the United States were assembled in Rangoon; fifteen trucks were fitted out as ambulances, which were used also to transport Red Cross supplies to Free China. The American Volunteer Group keep the road open by attacking Japanese bombers who fly over it from Indo-China.

ESTIMATE OF MEN KILLED IN THE PRESENT WAR

According to the statisticians of the Metropolitan Life Insurance Company, New York, deaths in the armed forces of all of the belligerent nations in the present war probably have reached at least 1,500,000 and may exceed 2,000,000. This estimate of loses is based on the compilation of analysis of data from sources which the Metropolitan Information Service believed most reliable. In the first World War the statisticians estimated that 5,000,000 men had been killed in a corresponding period; that is, the period of July 1914 to the end of 1916.

COLONEL GRANT APPOINTED AIR SURGEON

The post of air surgeon in the U. S. Army was recently created, the War Department announced recently, and Col. David W. Grant, M.C., was the first officer assigned to the new position. The air surgeon, who will be a member of the staff of the chief of the Army air forces, will be head of a service to coordinate the medical activities in the air service. In Colonel Grant's case, this duty will be in addition to that performed by him as chief of the medical division, office of the chief of the air corps.

EMERGENCY MEDICAL FIELD SETS

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York City, during January has given eight emergency medical field sets to the medical directors of the second civilian defense region (New York, New Jersey, Delaware) and also one set each to Chicago, Minneapolis and Reno. The membership in the Medical and Surgical Relief Committee of America has been augmented in the last three months by the names of thirty-three physicians, bringing the total membership to three hundred and fifty-one.

SPECIAL DEFENSE PROJECTS AT WAYNE UNIVERSITY

As an outgrowth of the defense program, Wayne University College of Medicine, Detroit, has undertaken several special projects, among which are the preparation of an index of the literature on military medicine covering the period from 1939 to date, a study of "shock" and a special study of "bacteriologic aspects of wound infections." The index has already been microfilmed by the Army Medical Library for military use.

ERIE ORGANIZES EMERGENCY SQUADS

The medical defense committee of Erie, Pa., of which Dr. Arthur G. Davis is chairman for the local medical society, has organized eight emergency medical field units and established evacuation medical centers in each of the wards of the city. Each squad comprises four physicians, one dentist and four nurses. Four squads have been assigned to the Hamot and four to St. Vincent's Hospital. These hospitals also have organized emergency teams for the care of the injured after they reach the hospital, where emergency beds have been made available. These emergency squads and evacuation centers have already held several practice sessions.

THE O'REILLY GENERAL HOSPITAL

Col. George B. Foster, M. C., has been assigned as commanding officer of the new thousand bed O'Reilly General Hospital of the U. S. Army, which was recently dedicated at Springfield, Mo.; Lieut. Col. Allan W. Dawson, M. C., U. S. Army, has been assigned as executive officer.

MEETING OF SELECTIVE SERVICE AND INDUCTION BOARD PHYSICIANS

The Maryland Society of Selective Service and Induction Board Medical Examiners held a meeting in Baltimore, January 30, with Dr. Sydney R. Miller presiding. Albert C. Gakenheimer gave a demonstration of equipment for administration of blood plasma, Lieut. Col. Amos R. Koontz, M. C., discussed the new local board examination plan and Major Henry M. Thomas Jr., M. C., experience on the medical service of a station hospital.

JEFFERSON COUNTY ALABAMA FIRST AID STATIONS

Fifty physicians have been assigned to supervise the first aid stations in the twenty-one air raid warden areas in Jefferson County, Ala., in which Birmingham is located. The selections were made by the chief of the civilian defense emergency medical service, Dr. H. Earle Conwell, Birmingham, and approved by the director of the civilian defense council. The fifty physicians, in addition to supervising first aid stations, will have charge of the transportation of wounded in case of air raids or other disaster.

SYMPOSIUM ON NUTRITION

An exhibit on army nutrition and a symposium for reserve officers will be held Jan. 13, 1942, in the Federal Building, 90 Church Street, New York City, at 8:30 p. m. The speakers will be Cols. Samuel Adams Cohen and H. I. Teperson of the medical reserve, Lieut. Col. James A. Tobey of the Sanitary Corps Reserve and Major Louis Griesman of the Veterinary Corps Reserve. The program is under the supervision of Lieut. Col. William C. Lippold, M. C., U. S. Army, and the chairman of the executive committee, Col. Milton I. Strahl.

LECTURE ON CHEMICAL WARFARE

Col. Curtis Claassen, M. C., U. S. Army, addressed the medical staff of Mount Sinai Hospital, New York, and the medical officer personnel of the Third General Hospital, U. S. Army, February 10, on "Defense Against Chemical Warfare and the Treatment of Gas Casualties."

SOLDIERS FORBIDDEN TO HITCH-HIKE

The War Department reminded all men in uniform January 18 that the solicitation of free rides is prohibited as being unmilitary and in some states unlawful. However, the War Department permits soldiers to accept offers of rides voluntarily made by individuals or organizations.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

DANGERFIELD, Harold, 1st Lieut., Staten Island, N. Y., Camp Lee, Va.
FAZIO, Michael G., 1st Lieut., Brooklyn, Fort Dix, N. J.
GRUSKIN, Harry, 1st Lieut., Brooklyn, Fort Tilden, N. Y.
ISRAEL, Benjamin, 1st Lieut., New York, Camp Lee, Va.
KAPLAN, Lawrence G., 1st Lieut., Forest Hills, L. I., N. Y., Fort Wadsworth, N. Y.
KLINE, Ernest Hall, Captain, Nyack, N. Y., Fort Hancock, N. J.
KUFLIK, William E., 1st Lieut., Brooklyn, Fort Wadsworth, N. Y.
LaBARBERA, Thomas, 1st Lieut., Brooklyn, Fort Dix, N. J.
LEVINE, Bernard R., 1st Lieut., New York, Fort Wadsworth, N. Y.
LITTMAN, Julius Kiva, 1st Lieut., New York, Camp Lee, Va.
MANNING, Ephraim L., 1st Lieut., Yonkers, N. Y., Camp Lee, Va.
McDONNELL, George J., 1st Lieut., Freehold, N. J., Fort Hancock, N. J.
MILES, Anthony W., 1st Lieut., Brooklyn, Fort Wadsworth, N. Y.
PAPPALARDI, Felix A., 1st Lieut., New York, Fort Hancock, N. J.
SEAMAN, George J., 1st Lieut., Brooklyn, Fort Dix, N. J.
SHERMAN, Pincus, 1st Lieut., New York, Pine Camp, N. Y.
SHI[illegible]MAN, Morris, 1st Lieut., New York, Headquarters 2d Military Area.
[illegible]MON, Charles, 1st Lieut., Brooklyn, Fort Niagara, N. Y.
WARNOCK, George H., 1st Lieut., Freeport, L. I., N. Y., Fort Sheridan, Ill.
WEISS, Bernard, 1st Lieut., Poughkeepsie, N. Y., Fort Niagara, N. Y.
WYCOFF, Joseph W., 1st Lieut., Hicksville, N. Y., Fort Monmouth, N. J.

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

BOOKER, John Parks, 1st Lieut., Walhalla, S. C., Camp Gordon, Ga.
HOLBROOK, Joseph Samuel, 1st Lieut., Statesville, N. C., Camp Blanding, Fla.
HULL, Wallace A., 1st Lieut., Indianola, Miss., Camp Tyson, Tenn.
JENKINS, Hughes B., Major, Donalsonville, Ga., Camp Gordon, Ga.
LAIRD, Earl Lee, 1st Lieut., Union, Miss., Camp Gordon, Ga.
LANCASTER, Lamar L., 1st Lieut., Bartow, Fla., Camp Gordon, Ga.
LOBRANO, Charles M., 1st Lieut., Memphis, Tenn., Fort McPherson, Ga.
MASON, James M., III, 1st Lieut., Birmingham, Ala., Fort Bragg, N. C.
TUCKER, Landrum S., 1st Lieut., Rogersville, Tenn., Camp Tyson, Tenn.
VINSANT, Lowell Eugene, 1st Lieut., Knoxville, Tenn., Camp Gordon, Ga.
WEATHERLY, George Irving, Jr., 1st Lieut., Fort Payne, Ala., Camp Forrest, Tenn.
WOLFE, Albert B., 1st Lieut., Orangeburg, S. C., Camp Gordon, Ga.

Orders Revoked

BRANTLEY, James W., 1st Lieut., Grandin, Fla.
BURTON, John Paul, 1st Lieut., New Orleans.
GEORGE, Wallace E., 1st Lieut., West Columbia, S. C.
JAFFE, Bernard, 1st Lieut., Asheville, N. C.
LOGAN, James G., 1st Lieut., Natchez, Miss.
NAUGLE, Thomas C., 1st Lieut., East Gadsden, Ala.
NELSON, Thomas F., 1st Lieut., Tampa, Fla.
ROZIER, John Simpson, 1st Lieut., Leesville, La.
SHIPP, Larry G., 1st Lieut., Anniston, Ala.

FIFTH CORPS AREA

The following named Medical Reserve officers were ordered to extended active duty by Fifth Corps Area order for the week ending January 16, 1942:

BECKER, William, 1st Lieut., Toledo, Ohio, Fort Knox, Ky.
CHAMBERLAIN, Webb P., Jr., Captain, Cleveland, Fort Hamilton, N. Y.
ECKSTEIN, Richard W., 1st Lieut., Cleveland, Erie Proving Ground.
ELKINS, Charles W., Captain, Lakewood, Ohio, Fort Hamilton, N. Y.
HANGER, Irwin C., Major, Beechwood Village, Ohio, Fort Hamilton, N. Y.
HARVEY, Bennett B., 1st Lieut., Indianapolis, Camp Grant, Ill.
HOY, Robert T., Jr., 1st Lieut., Fort Thomas, Ky., Fort Thomas, Ky.
IMBURGIA, Frank J., 1st Lieut., Marion, Ind., Fort Benjamin Harrison, Ind.
JOHNSON, Herbert H., Jr., 1st Lieut., Cleveland, Fort Jackson, S. C.
JORDAN, Valdemar M., 1st Lieut., Cleveland Heights, Ohio, Fort Hamilton, N. Y.
OLSEN, Albert L., Captain, Marion, Ind., Fort Hayes, Ohio.
ROSSMILLER, Harold R., 1st Lieut., Cleveland, Fort Benjamin Harrison, Ind.
RUNDELL, Karl D., 1st Lieut., Owego, N. Y., Fort Jackson, S. C.
SWANN, Layson Bernard, 1st Lieut., Louisville, Ky., Erie Proving Ground, Lacarne, Ohio.
TANNO, Anthony M., 1st Lieut., Cleveland, Fort Benjamin Harrison, Ind.

Orders Revoked

JASKIEWICZ, Casimir F., 1st Lieut., Logan, W. Va.
MORRISON, William H., 1st Lieut., Howe, Ind.
PETRO, George J., 1st Lieut., Louisville, Ky.
TOUPKIN, Jerome H., 1st Lieut., Raleigh, W. Va.
WILSON, Orley E., 1st Lieut., Elkhart, Ind.

SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

BIZZELL, Ross, 1st Lieut., Little Rock, Ark., Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
CASH, Paul Thalbert, 1st Lieut., Omaha, Corps Area Service Command Station Hospital, Fort Omaha, Neb.
HUNDLEY, Louis King, Captain, Fayetteville, Ark., Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
LAWSON, Mason Glynn, 1st Lieut., Texarkana, Ark., Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
MINER, Paul Floyd, 1st Lieut., Laramie, Wyo., Corps Area Service Command Station Hospital, Fort Francis E. Warren, Wyo.
RADL, Robert Bernard, Major, Bismarck, N. D., State Headquarters Selective Service, Bismarck, N. D.
RIGGINS, Winston Calaway, 1st Lieut., Little Rock, Ark., Corps Area Command Service Station Hospital, Camp J. T. Robinson, Ark.
SETTLE, Emmett Bird, Captain, Rockport, Mo., Corps Area Service Command Station Hospital, Fort Leavenworth, Kan.
WILLIAMS, John Westerfield, 1st Lieut., Springfield, Mo., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.

Orders Revoked

FREEDLAND, Morris E., 1st Lieut., Minneapolis.
FROGNER, Lester E., 1st Lieut., Grand Marais, Minn.
HARTWIG, John A., Captain, St. Louis.

Relieved from Active Duty

BAKER, Joseph Harrison, Captain, LaCrosse, Kan., Corps Area Service Command Station Hospital, Fort Riley, Kan.
GANSCHOW, John Henry, 1st Lieut., Hedrick, Iowa, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
LUEDDE, Philip Shryock, Captain, St. Louis, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark.
MILLER, Richard White, 1st Lieut., Fayetteville, Ark., Army and Navy General Hospital, Hot Springs, Ark.
ZELIGS, Isadore, 1st Lieut., Iowa City, Corps Area Service Command Station Hospital, Fort Riley, Kan.

EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

BAILEY, William M., Lieut. Colonel, Tyler, Texas, Recruiting Station, Sante Fe, N. M.

BOGUSKIE, William M., Captain, Hearne, Texas, Corps Area Service Command, Camp Barkeley, Texas.

DAVIS, James H., Colonel, Fort Worth, Texas, Recruit Reception Center, Camp Wolters, Texas.

FIEGEL, Walter L., 1st Lieut., Lewisville, Texas, Station Hospital, Fort Sill, Okla.

FIELDING, Lewis J., 1st Lieut., Waco, Texas, District Recruiting Office, Phoenix, Ariz.

FOWLER, Harmon L., Colonel, Denver, Recruit Reception Center, Fort Bliss, Texas.

GAMBRELL, James H., Colonel, El Paso, Texas, Station Hospital, Camp Barkeley, Texas.

GLOVER, George E., Lieut. Colonel, Austwell, Texas, Recruit Reception Center, Fort Sam Houston, Texas.

KELLER, Louis, 1st Lieut., Whipple, Ariz., 45th Division, Camp Barkeley, Texas.

LAWRENCE, Gerald P., Colonel, Mayhill, N. M., Reception Center, Fort Sill, Okla.

LEVINE, Milton, Captain, Fort Bayard, N. M., 36th Division, Camp Bowie, Texas.

LEWIS, W. B., Colonel, Denver, Colorado Recruiting District, Fort Logan, Colo.

MATTS, Robert M., Captain, Yuma, Ariz., 25th Infantry, Fort Huachuca, Ariz.

POORE, Alfred M., 1st Lieut., Waco, Texas, Station Hospital, Fort Sill, Okla.

ROBERTSON, Robert C. L., 1st Lieut., Houston, Texas, Station Hospital, Fort Sam Houston, Texas.

SHADDIX, James W., Lieut. Colonel, Shamrock, Texas, Recruiting Station, Lubbock, Texas.

SHIELDS, Thomas L., 1st Lieut., Dallas, Texas, 2d Infantry Division, Fort Sam Houston, Texas.

STUCK, Ralph M., 1st Lieut., Denver, Station Hospital, Fort Bliss, Texas.

WILHITE, Lee Roy, Colonel, Perkins, Okla., U. S. Army Recruiting Station, Houston, Texas.

Orders Revoked

BARSH, Albert G., 1st Lieut., Stephenville, Texas.

DAVIS, Robert L., 1st Lieut., Williams, Ariz.

KILMAN, Prather T., Captain, Malakoff, Texas.

KINSINGER, Ralph R., 1st Lieut., Blackwell, Okla.

McCURDY, William C., Jr., 1st Lieut., Purcell, Okla.

McGEHEE, Frank O., 1st Lieut., Memphis, Tenn.

PRESTON, Thomas K., 1st Lieut., Muskogee, Okla.

SALMON, George W., 1st Lieut., St. Louis.

SCIRE, Feliciano J., 1st Lieut., Keams Canyon, Ariz.

ORDERED TO FOREIGN DUTY

[Some of these orders were issued prior to Dec. 8, 1941.]

ANDERSON, Vetalis Vernon, 1st Lieut., Fort Bliss, Texas, 200th Coast Artillery (Antiaircraft), Fort Stotsenburg, Philippine Islands.

ANDLER, Maxwell M., Jr., 1st Lieut., Brookline, Mass., 12th Medical Regiment, Fort William McKinley, Philippine Islands.

BARNES, Louis Dwight, Major, 57th Infantry, Fort William McKinley, Philippine Islands.

BARSHOP, Nathan, Captain, Los Angeles, Station Hospital, Fort Stotsenburg, Philippine Islands.

BLOOM, Manuel Gordon, 1st Lieut., Houston, Texas, Station Hospital, Fort Mears, Dutch Harbor, Alaska.

BOLTON, Leslie Turner, Lieut. Colonel, Reno, Nev., Headquarters Philippine Department, Fort Santiago, Manila, Philippine Islands.

BULFAMONTE, Joseph Charles, 1st Lieut., Fort William McKinley, Philippine Islands.

BURGE, Julius Caesar, Jr., 1st Lieut., York, S. C., Station Hospital, Fort William McKinley, Philippine Islands.

CARTER, James Weldon, 1st Lieut., Lubbock, Texas, Fort Amador, Balboa, Canal Zone.

CHOISSER, John Elder, Lieut. (j. g.), M. C.-V. (G.) N. R., Eldorado, Ill., U. S. S. *Boise*, Pearl Harbor, Hawaii.

COCHRAN, Joel Layton, Major, Camp Wolters, Texas, Fort Amador, Balboa, Canal Zone.

COLBY, Elliott Gillette, Lieut. Colonel, N. G., San Diego, Calif., 251st Coast Artillery (Antiaircraft), Camp Malakole, Hawaii.

COLVARD, George Todd, Major, N. G., Fort Bliss, Texas, 200th Coast Artillery (Antiaircraft), Fort Stotsenburg, Philippine Islands.

COMSTOCK, Jack Arthur, 1st Lieut., Denver, Sternberg General Hospital, Manila, Philippine Islands.

CONLAN, Francis Joseph, 1st Lieut., San Francisco, Station Hospital, Fort Mears, Dutch Harbor, Alaska.

DOBIAS, Stephen Glenn, 1st Lieut., Fort Leavenworth, Kan., Fort Greely, Kodiak, Alaska.

DONNELLY, Verner Judson, Lieut. (j. g.), M. C.-V. (G.) N. R., Plainview, Texas, U. S. S. *Minneapolis*, Pearl Harbor, Hawaii.

FLOCKS, Milton, 1st Lieut., Baltimore, U. S. Engineers, Borinquen Field, Puerto Rico.

FOLSOM, Charles Walton, Captain, Sternberg General Hospital, Manila, Philippine Islands.

GARRETT, Robert Thompson, 1st Lieut., Southhampton, N. Y., Hickam Field, Hawaii.

GLUSMAN, Murray, Lieut. (j. g.), M. C.-V. (S.) N. R., New York, Dispensary, Navy Yard, Cavite, Philippine Islands.

HALL, Joseph Leslie, 1st Lieut., Fort William McKinley, Philippine Islands.

HANKINS, Charles Robert, 1st Lieut., Fort Leonard Wood, Mo., Seward, Alaska.

HELSLEY, Gordon Friedrich, Lieut. Colonel, N. G., Fresno, Calif., Fort Greely, Kodiak, Alaska.

JACOB, Samuel Sprigg, III, Captain, Station Hospital, Coroxal, Canal Zone.

JORDAN, Fred Covington, Jr., 1st Lieut., Phoenix, Ariz., Fort Ruger, Honolulu, Hawaii.

JULIA, Carlos M., Captain, N. G., Rio Piedras, Puerto Rico, Camp Tortuguero, San Juan, Puerto Rico.

KELLY, Alex Rennie, Jr., 1st Lieut., Camp Davis, N. C., Station Hospital, Fort William McKinley, Philippine Islands.

KESCHNER, Harold Walton, 1st Lieut., New York, Sternberg General Hospital, Manila, Philippine Islands.

McGUIGAN, Robert Alister, Lieut. (j. g.), M. C.-V. (G.) N. R., Evanston, Ill., U. S. S. *Dobbin*, Pearl Harbor, Hawaii.

MOONEY, Robert Davis, 1st Lieut., Station Hospital, Fort Richardson, Alaska.

OLIVER, Claudius Hansen, Lieut. Colonel, San Antonio, Texas, Fort Davis, Canal Zone.

OSBORNE, Charles Eugene, 1st Lieut., Camp Wheeler, Ga., Fort Stotsenburg, Philippine Islands.

PASSALACQUA, Luis Antonio, Captain, N. G., Ponce, Puerto Rico, Station Hospital, Losey Field, Ponce, Puerto Rico.

PHILLIPS, Claude Mason, Captain, San Antonio, Texas, Camp Paraiso, Canal Zone.

RAMSAY, Lewis Cowan, 1st Lieut., Medical Department, 804th Engineers, Schofield Barracks, Honolulu, Hawaii.

SERVOSS, Spencer Joseph, 1st Lieut., Medina, N. Y., Medical Dispensary, Albrook Field, Canal Zone.

SCHLESINGER, George Gerard, Lieut. (j. g.), M. C.-V. (G.) N. R., New York, Submarine Base, Pearl Harbor, Hawaii.

SCHULTZ, Frank Bernard, Captain, Falls Church, Va., Tripler General Hospital, Honolulu, Hawaii.

SHAPIRO, William Mordecai, Lieut. Colonel, Toledo, Ohio, Station Hospital, San Juan, Puerto Rico.

SHIVELY, Russell Lowell, 1st Lieut., Celina, Ohio, Henry Barracks, Cayey, Puerto Rico.

SILVA, Euripedes, Lieut. Colonel, N. G., San Juan, Puerto Rico, Camp Tortuguero, San Juan, Puerto Rico.

SIMMONS, Warren Kousch, 1st Lieut., Station Hospital, Fort Mears, Dutch Harbor, Alaska.

SLAGLE, Thomas Dick, Lieut., M. C.-V. (S.) N. R., Franklin, N. C., 10th Naval District, San Juan, Puerto Rico.

SMITH, Martin Pendry, Lieut. (j. g.), M. C.-V. (S.) N. R., Erie, Pa., Naval Hospital, Guam.

STILSON, Homer Oscar, 1st Lieut., N. G., 251st Coast Artillery (Antiaircraft), Camp Malakole, Hawaii.

STONE, Charles Michael, Lieut. (j. g.), M. C.-V. (S.) N. R., Jamaica, N. Y., Naval Mobile Base Hospital No. 2, Pearl Harbor, Hawaii.

THOMPSON, Charles Middleton, II, Lieut., M. C.-V. (S.) N. R., Newtown, Pa., Naval Hospital, Pearl Harbor, Hawaii.

THOMPSON, Ferris Wilson, Lieut. Commander, M. C.-V. (G.) N. R., Aiea, Hawaii, Naval Hospital, Pearl Harbor, Hawaii.

TONG, Fock Hing, Captain, N. G., Honolulu, Hawaii, 299th Infantry, Camp Pankukalo, Wailuku, Hawaii.

TREXLER, Clarence William, Lieut., M. C.-V. (S.) N. R., Honolulu, Hawaii, Submarine Base, Pearl Harbor, Hawaii.

URE, William Grant, Tucson, Ariz., Station Hospital, Fort Greely, Kodiak, Alaska.

VANDEVALDE, Joseph Daniel, 1st Lieut., Fort William McKinley, Philippine Islands.

WADSWORTH, John Henry, 1st Lieut., Cobleskill, N. Y., Station Hospital, Borinquen Field, Puerto Rico.

WALKER, Price Mars, Major, Dallas, Texas, Station Hospital, Schofield Barracks, Honolulu, Hawaii.

WHITE, William Alvin, Jr., Lieut. (j. g.), M. C.-V. (G.) N. R., Canton, Ohio, Naval Hospital, Pearl Harbor, Hawaii.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 2240 has been ordered reported by the Senate Committee on Military Affairs, proposing to establish a Women's Army Auxiliary Corps for service with the Army of the United States. H. R. 3539, has passed the House and is pending in the Senate with a favorable committee report providing, in effect, that revenue derived from the operation of Indian Service hospitals in Alaska shall be available for expenditure for the benefit of such hospitals.

Bills Introduced.—H. R. 6521, introduced by Representative Beiter, New York, proposes to extend the benefits of the Soldiers' and Sailors' Civil Relief Act in connection with mortgages and instalment contracts to transactions originating subsequent to Oct. 17, 1940. Under existing law relief is provided by the act only with respect to such transactions originating prior to the date named. H. R. 6524, introduced by Representative Secrest, Ohio, proposes to increase the federal appropriation available to provide books for the adult blind. H. R. 6525, introduced by Representative Voorhis, California, provides compensation for personnel sustaining disease or injury while performing civilian defense duty.

STATE MEDICAL LEGISLATION

Kentucky

Bills Introduced.—S. 76 proposes to prohibit the operation of any hospital or clinic, whether private or governmental, without a license to do so from the state board of health. H. 144 proposes to enact a practice act for dental hygienists to be administered by the state board of dental examiners. "Dental hygiene" is defined in the bill to mean the treatment of human teeth by removing therefrom calcareous deposits, and by removing accumulated accretion from directly beneath the free margin of the gums, and by polishing the exposed surface of the teeth.

Mississippi

Bills Introduced.—H. 231 proposes to authorize counties, cities and towns, separately or jointly, to own, erect, maintain and operate hospitals, and to levy taxes to raise necessary funds for such purposes. H. 361 proposes to authorize the board of supervisors of the various counties in the state to levy annually, in addition to the levy for indigent sick, a special tax of not exceeding 1 mill on all the taxable property of the county to raise sufficient funds for necessary medical, dental or other treatment to children up to 16 years of age in need of and unable to procure care. H. 298, to amend the law creating a state hospital commission to reimburse certain approved hospitals for hospital care rendered indigent patients, proposes to abolish the state hospital commission provided for therein and to provide in lieu thereof for the appointment of a state hospital commissioner by the state board of health and to vest all of the power and authority now vested in the state hospital commission in that commissioner.

South Carolina

Bill Introduced.—S. 980, to amend the uniform narcotic drug act, proposes (1) to define narcotic drugs so as to include cannabis in addition to "coca leaves, opium, and every substance neither chemically nor physically distinguishable from them," the definition in the present law, and (2) that the provisions of the act shall not apply to the administering, dispensing or selling at retail of any medicinal preparation that contains in 1 fluid ounce, or if a solid or semisolid preparation, in 1 avoirdupois ounce, not more than 1 grain of codeine or of any of its salts. The present law provides a similar exemption with respect to preparations which in the quantities stated do not contain more than 2 grains or opium, ¼ grain of morphine, 1 grain of codeine, or ⅛ grain of heroin.

New York

Bills Introduced.—S. 245 and A. 288 propose to provide for the reimbursement by the state to each public welfare district for hospital care rendered to patients suffering from tuberculosis. S. 491 proposes to require the board of education in each city of the state to establish, maintain and equip a permanent staff of physicians, psychiatrists, dentists, dental hygienists and nurses for the periodic examination and promotion of the health of the children of school age in such city. S. 523 proposes to require every local board of health and every health officer to exercise proper and vigilant medical inspection of all persons 21 years of age or over, infected with poliomyelitis and, after approval by the state commissioner of health, provide at the remedial stages of the disease suitable surgical, medical or therapeutic treatment or hospital care, and necessary appliances and devices for such persons so infected or exposed who cannot otherwise be provided for. One half of the cost of providing the necessary treatment, care and appliances is made a charge against the county, or the city of New York, as the case may be, in which such person resides, and the remaining one half is to be paid by the state. A. 604 proposes to authorize the establishment and operation of a psychiatric bureau as an adjunct of the children's court in any county, for the physical, mental and psychiatric examination of persons within the jurisdiction of the court. Any such bureau shall be staffed with one or more competent psychiatrists and others, in accordance with appropriate authorization, who shall be appointed by the judge of the court and serve under his direction.

New Jersey

Bill Introduced.—S. 10, to amend the dental practice act, proposes, among other things, that the act shall not apply to the treatment of the diseases of the mouth and practice of oral surgery in the practice of his profession by a physician or surgeon licensed under the laws of the state, unless he undertakes to reproduce or reproduces lost parts of the human teeth in the mouth or to restore or replace lost or missing teeth in the mouth. Under the present law, apparently, the act, as far as the practice of licensed physicians and as far as specific language is concerned, does not apply to the rendering of dental relief in emergency cases by a physician in the practice of his profession.

Virginia

Bills Introduced.—S. 110, to amend the medical practice act, proposes to increase the per diem remuneration to be paid to members of the board of medical examiners to $10 and to increase the annual salary of the secretary of the board to $2,000. H. 166, to supplement the medical practice act, proposes to make it unlawful for any person to engage in the practice of medicine in the state without first having obtained from the board of medical examiners the necessary license or certificate and without first having recorded the license or certificate with the clerk of the appropriate court. H. 195 proposes to enact a separate chiropractice practice act and to create an independent chiropractic board of examiners to examine and license applicants for licenses to practice chiropractic. The bill proposes to define chiropractic as "the adjustment of the twenty-four movable vertebrae of the spinal column and other articulations, and assisting nature, for the purpose of facilitating the transmission of nerve energy." The bill proposes that a chiropractic licentiate may use such methods as are taught by chiropractic schools and colleges to further

assist nature in establishing the normal transmission of nerve energy, but is prohibited from practicing operative surgery, obstetrics, osteopathy, and from administering or prescribing any drug or medicine. Such a licentiate is to be permitted to use the title "Dr." in connection with his name when accompanied by the word "chiropractor" or the letters "D.C." S. 120 proposes to prohibit any institution of learning in the state, unless accredited by the state board of education, from conferring any college degree, whether academic, professional or honorary.

MEDICAL ECONOMIC ABSTRACTS

JAPAN'S RESOURCES

While Japan demands greater space for her population, she bends all her energies to increasing that population. Moreover, industrial and general social conditions maintain that threaten to destroy the producing power of the population. The statisticians of the Metropolitan Life Insurance Company, after a study of Japan's population conditions, point to a rather abrupt reversal from a fairly rapid increase to a pronounced decline about 1935. Then the cabinet, early in 1941, entered on a program which aimed to increase Japan's population from its present figure of seventy-three million to a hundred million in 1960. This plan offers subsidies to large families with corresponding penalties to small families and unmarried persons.

While Japan has eleven million men in the principal military age, 20 to 44, the United States has a reserve of more than double that number. This is due not only to our greater total population but to the fact that the United States has 38.5 per cent of its male population in this military age group while Japan has only 34 per cent. The general death rate in Japan is comparable to that in the United States forty years ago. While the tuberculosis death rate in this country is 45 per hundred thousand, it was 204 per hundred thousand in Japan in 1937.

Another side of the picture is seen in the world economic survey of the League of Nations published in this country by the University of Columbia Press. This shows that even in 1939 Japan was beginning to show signs of fatigue in her economic system. In the early part of that year "it was recorded, for instance, that a considerable increase in the number of fires in factories in the Tokyo area was largely due to the excessive fatigue of the workers. Moreover, the statistics of sickness, accidents and absence from work began to rise. Accordingly, on March 31, 1939 the government issued an order for the protection of workers employed in branches of industrial activity where work necessitated by the requirements of national defense was carried on. This order, fixing a maximum working day of twelve hours, came into effect on May 1. In the spring of 1938 a 'National General Mobilization Law' was enacted with the object of increasing the supply and efficiency of labor and of raising the productivity of industrial equipment. In April 1940 a Japanese source stated that it was 'doubtful' whether the result had been 'satisfactory.' 'Labor efficiency,' it said, 'has lately become strikingly low.'

"The material equipment was likewise deteriorating. Plant and machinery were wearing out and could not be adequately replaced; and this consumption of capital was taking place not only in the 'inessential' consumer trades but also in the armament industries." As a result of these conditions, the survey points out that as "Japan has been at war continuously since the middle of 1937 she has had time to organize her war economy to the limit of her capacity; and yet in 1940-41 she was not able to extract much more than a quarter of her national income for war purposes. In a relatively poor country, obviously the margin between total production and the subsistence minimum of consumption is narrow."

NEW MORTALITY RECORD

In spite of a minor influenza epidemic and the dislocation of the population as a result of national defense efforts, the statisticians of the Metropolitan Life Insurance Company declare that the 1941 death rate of 7.4 per thousand was the lowest ever attained in any year by their company's millions of industrial policyholders, and, as a result, the expectation of life of these insured persons was advanced to 63.4 years, a gain of some six months over the 1940 figure of 62.9 years.

Owing largely to the sharp rise in motor vehicle fatalities, the death rate from accidents—all forms—increased. The motor vehicle fatality rate of 1941, 20.8 per hundred thousand, was 14.3 per cent above that of 1940 and the highest since 1937.

When the United States entered the first world war in 1917 the statisticians explain that the death rate among insured persons was 11.6 per thousand, or more than half as high again as that recorded for 1941.

The pneumonia death rate, as the result largely of the use of sulfonamide derivatives, dropped to the new low level of 30.5 per hundred thousand, which compares with 35.5 in 1940, 42.8 in 1939, 50.6 in 1938 and 66.9 in 1937. Prior to 1937 the pneumonia mortality rate had never fallen below 60 per hundred thousand.

Second only to the improvement in pneumonia mortality conditions was the situation with respect to tuberculosis, the death rate of which once more dropped to a new low point, as it has many times in recent years.

An interesting development with respect to tuberculosis has resulted in connection with the Selective Service Act. "As the rejections for respiratory diseases—largely tuberculosis—are but little below those in the last war," the statisticians explain, "while mortality from the disease has declined 77.3 per cent, it appears that a good job of early case finding is being done."

New minimal rates were also recorded last year for scarlet fever, diphtheria, appendicitis and diseases of the puerperal state. A minimum low maternal mortality rate occurred despite a sharp rise in the number of women exposed to the hazards of pregnancy and childbirth, since the birth rate in 1941 was the highest on record since 1930.

WOMAN'S AUXILIARY

California

The medical society is cooperating with the Alameda County woman's auxiliary in furnishing speakers for organizations requesting talks on medical subjects. It in turn has asked the auxiliary to be ready to assist the society by furnishing a telephone committee to handle appointments for volunteer donors to the San Francisco blood bank.

The outstanding activity at present in the San Francisco County auxiliary is that of sponsoring a day at the San Francisco Hospitality House, located in the Civic Center. The auxiliary is planning on providing at least three hundred young men with food and amusement during the day. The building will be staffed that day with auxiliary members. The training schools of Stanford and of the University of California have been asked to cooperate with the doctors' wives by sending twenty-five girls from each of these schools. The girls will be called for and delivered back to their dormitories by members of the auxiliary. Mrs. Wilber Swett, general chairman, will be assisted by Mrs. Raleigh Burlingame, Mrs. John Humber, Mrs. John J. Loutzenheiser, Mrs. Roger B. McKenzie and Mrs. William A. Sumner.

At a recent meeting of the Woman's Auxiliary to the San Diego County Medical Society one hundred and one members and guests were served at luncheon. Invitations were issued to wives of Army and Navy physicians new in the community.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

New Health Center.—A new health and welfare center will soon be constructed in Tucson, according to the *Arizona Public Health News*. Health and welfare agencies will be housed in the new building, the architect's plans for which have already been approved.

Changes in Health Officers.—Dr. Abe L. Scheff, formerly of Rosedale, Miss., passed assistant surgeon, U. S. Public Health Service, reserve, has been appointed director of the Santa Cruz Health Service, which on January 1 ceased to be a part of Health District Number 1. According to the *Arizona Public Health News* the importance of Nogales and Santa Cruz County in the present emergency and the development of needed health services make a full time resident director necessary. ——Dr. Robert M. Matts, Yuma, director of the Yuma County Health Service, has been called into active service.

CALIFORNIA

Library on Plastic Surgery.—On December 12 a collection of fifty-seven books on plastic surgery was received by the Library of the Los Angeles County Medical Association, Los Angeles, under a bequest in the will of the late Dr. Howard L. Updegraff, Los Angeles. The gift included also a group of famous medical caricatures. The books date from 1528 to 1939 and include "The Proportion of Human Anatomy," published by Albrecht Dürer in Nuremberg in 1528, and a volume of Celsus' work, also published in 1528 by the Aldine Press. The most recent of the group is "The Surgery of Injury and Plastic Repair" (Dr. Samuel Fomon) 1939.

Santa Monica Hospital Dedicated.—The Santa Monica Hospital was dedicated on January 4 as a unit of the Lutheran Hospital Society of Southern California. This hospital was turned over to the California Hospital, Los Angeles, operated by the society, early in January 1941, fulfilling the plans of Dr. William S. Mortensen, president and medical superintendent of the Santa Monica Hospital, to convert his corporation into a nonprofit institution for the citizens of Santa Monica. With Dr. Mortensen, Mrs. Hromadka, widow of Dr. August B. Hromadka, arranged the gift as a trust to the Lutheran Hospital Society, and the recent ceremonies dedicated the hospital as a memorial to the two physicians.

COLORADO

Society News.—The Pueblo County Medical Society was recently addressed by Drs. Harold T. Low and Harry E. Coakley, Pueblo, on "Congenital Intravesical Obstruction in Male Children."——Dr. Roy P. Forbes, Denver, discussed "Frequent Mistakes in Diagnosis" before the Weld County Medical Society in Greeley recently.

The Sewall Lecture.—Dr. Maurice C. Pincoffs, professor of medicine, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, delivered the Henry Sewall Memorial Lecture, February 3, in the Denison Memorial Auditorium, Denver, during the annual meeting of the Medical Society of the City and County of Denver. His subject was "Epidural Abscess."

ILLINOIS

Newspaper Cooperates in Mental Hygiene Project.—The state department of public welfare and the Waukegan *News-Sun* are cooperating in an experimental program, which opened on January 13, to determine the public's reaction to education in mental hygiene and allied subjects. Once a week a group of speakers is provided by the state department of public welfare at no charge to the community; the *News-Sun* arranges for the use of a local theater, and the lectures are designed to educate the public in the prevention of mental disease. A question and answer period concludes each session. The program, offered under the name of the Human Relations Institute, has the approval of the Lake County Medical Society. More than eighteen hundred persons attended the last session in January.

Chicago

Drs. Heyd and Ivy to Address Medical Society.—Dr. Charles Gordon Heyd, New York, formerly President of the American Medical Association, will address the Chicago Medical Society, at the Chicago Woman's Club, February 18, on "A Consideration of the Hepatorenal Syndrome" and Dr. Andrew C. Ivy, Nathan Smith Davis professor of physiology, Northwestern University Medical School, "Rationale of Bile Salt Therapy."

Annual Meeting of Heart Association.—The Chicago Heart Association will hold its annual meeting at the Chicago Woman's Club, February 16, with Dr. Sidney Strauss presiding. Other speakers on the program will be Mayor Edward J. Kelly and Dr. Morris Fishbein, Editor of THE JOURNAL. Brig. Gen. Lewis B. Hershey, director of the Selective Service System, Washington, D. C., will also speak on "The Medical Profession and Total War."

Physician Must Serve Sentence on Lottery Charge.—The Chicago *Sun* reported that Dr. Frank Deacon, physician at a CCC camp in East Tawas, Mich., must serve a sentence of a year and a day in a federal penitentiary, according to the verdict, December 23, of the First United States Circuit Court of Appeals in Boston. This verdict upheld Dr. Deacon's conviction in the United States District Court in Boston in June 1940, when he was found guilty of charges of conspiracy to transport lottery tickets interstate and cause them to be taken into Massachusetts, it was stated. Evidence showed that a million tickets, to sell at 50 cents each, had been printed monthly and that four prizes of $20,000 each were offered to the winners. The tickets were issued as "Will Rogers Memorial Hospital Charity Bonds." Dr. Deacon was said to be one of a group of twelve men and two women involved in the lottery ring which had been using the now defunct Will Rogers Memorial Hospital, 6970 North Clark Street, as a basis for their scheme. Altogether seventy-one men and three women were indicted by a federal grand jury. The physician was the only one who elected to stand trial. It was reported that the others pleaded guilty. Dr. Deacon once owned the Jackson Park Hospital. He graduated at the College of Physicians and Surgeons of Chicago in 1904 and was licensed to practice in Illinois the same year.

MICHIGAN

Pharmacist Honored.—The Michigan Branch of the American Pharmaceutical Association gave a banquet in honor of Leonard A. Seltzer, Sc.D., December 29, in Detroit. Dr. Seltzer is an associate member of the Wayne County Medical Society. Guest speakers at the dinner included Dr. Clarence E. Simpson, president of the county medical society, and E. Fullerton Cook, Pharm.M., of the Philadelphia College of Pharmacy and Science.

Professional Liaison Committee.—A Professional Liaison Committee representing the dental, pharmaceutic and medical professions, authorized by the 1941 house of delegates of the Michigan State Medical Society, has been formed as follows: representing the state dental society, C. H. Jamieson, D.D.S., Detroit; Harry F. Parks, D.D.S., Jackson, and F. D. Ostrander, D.D.S., Ann Arbor; representing the Michigan State Pharmaceutical Association, Jack H. Webster, Detroit; Bernard A. Bialk, Detroit, and C. B. Campbell, Jackson; representing the state medical society, Drs. Allan W. McDonald, Detroit; Harrison S. Collisi, Grand Rapids, and Fred R. Reed, Three Rivers.

MINNESOTA

The Bell Lecture.—William H. Feldman, D.V.M., Rochester, delivered the annual John W. Bell Lecture before the Hennepin County Medical Society, Minneapolis, February 2. His subject was "Chemotherapy of Experimental Tuberculosis."

Chemist Honored.—Ross Aiken Gortner, Ph.D., chief in the division of biochemistry, University of Minnesota, St. Paul, has been announced as the 1942 recipient of the Osborne Medal, presented by the American Association of Cereal Chemists to scientists who have rendered distinguished service in conducting research and training students in cereal chemistry. The medal will be presented at the annual meeting of the association next May. Dr. Gortner has been chief in the division of agricultural biochemistry at Minnesota since 1917, during which time he has trained many students who hold positions of leadership in research. He received his Ph.D. at Columbia University, New York, in 1909, joined the faculty at Minnesota in 1914 and was made full professor and division chief in 1917.

Society News.—Dr. George T. Pack, New York, addressed the Minneapolis Surgical Society in Minneapolis, February 5, on "Cancer of the Stomach."——Dr. Ralph M. Waters, professor of anesthesia, University of Wisconsin Medical School, Madison, delivered a Mayo Foundation lecture, January 22, on "The Evolution of Anesthesia."——Dr. Joseph F. Borg, St. Paul, gave the presidential address before the annual meeting of the Ramsey County Medical Society in St. Paul, January 26, on "Prognosis in Heart Disease: Contributions of the Electrocardiogram."——The Minnesota Pathological Society was addressed in Minneapolis, January 20, by Drs. Philip Hallock and Gerald T. Evans on "Orthostatic Hypotension" and George N. Aagaard Jr., "Transfusion Reactions Due to Rh Factor." All are from Minneapolis.

NEW JERSEY

Portrait of Dr. Haussling.—A portrait of the late Dr. Francis Reynolds Haussling, Newark, was unveiled in the board of trustees room of the Newark Memorial Hospital on Dec. 18, 1941. The picture was the gift of Mr. and Mrs. Jacob L. Newman. Dr. Haussling was at one time president of the Essex County Medical Society and of the Medical Society of New Jersey. At the time of his death, Aug. 4, 1941, he was an attending surgeon at the Newark Memorial Hospital.

NEW YORK

Course in General Medicine.—The state medical society will conduct the following course in general medicine before the Columbia County Medical Society at the Hudson City Hospital, Hudson. The lecturers, all of New York, will be:

Dr. David D. Moore, Diabetes Mellitus, March 12.
Dr. James L. Miller, Syphilis, March 26.
Dr. Paul Reznikoff, The Diagnosis and Treatment of Anemia, April 9.
Dr. William Goldring, Hypertension and Hypertensive Heart Disease, April 23.
Dr. Albert Vander Veer, Asthma, May 7.
Dr. Homer F. Swift, Rheumatic Fever, May 21.
Dr. John D. Lyttle, Nephritis, June 4.

Warning on Theft of Narcotics.—The New York State Department of Health, Albany, announces that additional precautions should be taken by hospital and institution authorities in the protection of stocks of legitimate narcotics in an effort to prevent further robberies committed by addicts and illegal dealers in drugs. The department announces that one man has been arrested who had in his possession two bottles containing two thousand tablets of a narcotic drug. An investigation revealed that these tablets and another bottle of one thousand tablets had been stolen from a hospital in the upstate area.

New York City

The Harvey Lecture.—Roger Adams, Ph.D., professor of organic chemistry and head of the department of chemistry, University of Illinois, Urbana, Ill., will deliver the fifth Harvey Society Lecture at the New York Academy of Medicine, February 19. His subject will be "Marihuana."

Ninety Years of Hospital Service.—With the appointment of a special committee, Mount Sinai Hospital announces a program to observe its completion of ninety years of service. It has planned to sponsor a series of lectures during the year to commemorate the event. Prof. Winifred C. Cullis, in charge of the women's section of the British Library of Information, New York, delivered the first lecture in one series, January 28, on "What British Women Are Doing in the War." A group of lectures will be given on blood chemistry. The speakers will include:

Dr. Donald D. Van Slyke, Acid Base Balance, February 20.
Dr. John P. Peters, New Haven, Conn., Serum Proteins in Health and Disease, March 6.
Dr. Fuller Albright, Boston, Phosphate Metabolism in Dysparathyroidism: Renal Insufficiency, Rickets and Osteomalacia, March 10.
Dr. Henry L. Jaffe and Aaron Bodansky, Ph.D., Serum Calcium: Clinical and Biochemical Considerations, March 13.
Dr. Reuben Ottenberg, Blood in Jaundice, April 21.
Warren M. Sperry, Ph.D., The Biochemistry of the Lipoidoses, April 28.

This hospital has always been conducted on a nonsectarian basis. It assumed its present name in 1866, moved to its present location at One Hundredth Street east of Fifth Avenue in 1904 and now occupies eighteen buildings covering about three city blocks and has a capacity of about eight hundred and fifty-six beds.

NORTH CAROLINA

Graduate Courses.—The school of medicine and the extension division of the University of North Carolina, in cooperation with local county medical societies, have arranged for a series of postgraduate courses at Fayetteville, Durham, Raleigh and Kinston. Dr. Marvin P. Rucker, Richmond, Va., opened the course at Durham, January 14, with a discussion on obstetrics, and Drs. Francis C. Wood and Baldwin H. E. W. Lucke, Philadelphia, conducted a clinical-pathologic conference on January 21. Other speakers in the series include:

Dr. William D. Stroud, Philadelphia, The Failing Heart of Middle Life, January 28.
Dr. Harrison F. Flippin, Philadelphia, Use of Sulfonamides in General Practice, February 4.
Dr. Richard B. Cattell, Boston, Surgery, February 11.
Dr. Charles F. McKhann, Ann Arbor, Mich., Pediatrics—Advances in the Treatment of Infectious Diseases in Children, February 18.

The course at Fayetteville opened, January 22, with Dr. Walter C. Alvarez, Rochester, Minn., speaking on "Diagnosis and Treatment of Common Diseases of the Gastrointestinal Tract." The rest of the course includes:

Dr. Stroud, The Failing Heart of Middle Life, January 29.
Dr. James E. Paullin, Atlanta, Ga., Endocrinology and Metabolism in General Practice, February 5.
Dr. Custis Lee Hall, Washington, D. C., Orthopedic Problems of the General Practitioner, February 12.
Dr. McKhann, Advances in the Treatment of Infectious Diseases in Children, February 19.
Dr. Percy S. Pelouze, Philadelphia, Infectious Diseases of the Genitourinary Tract, February 26.

OHIO

The Hanna Lecture at Western Reserve.—Dr. Eduardo Braun-Menéndez, lecturer in physiology and director of cardiovascular investigations, Faculty of Medical Sciences, University of Buenos Aires, will deliver the forty-seventh Hanna Lecture at the Western Reserve University School of Medicine, Cleveland, February 18. His subject will be "The Humoral Mechanism of Renal Hypertension."

PENNSYLVANIA

Society News.—A symposium on "Medical Aspects of Civilian Defense" was presented by Drs. Howard K. Petry, William Paul Dodds and Samuel B. Fluke, all of Harrisburg, at a recent meeting of the Dauphin County Medical Society in Harrisburg on February 3.——Dr. Thomas Peck Sprunt, Baltimore, will address the Harrisburg Academy of Medicine on "Diseases of the Liver," February 17.——At a meeting of the Washington County Medical Society in Washington, February 1, Dr. John O. Rankin, Wheeling, W. Va., spoke on "Preoperative and Postoperative Care of the Surgical Patient."

Philadelphia

Postgraduate Lectures.—A series of postgraduate lectures was presented in Philadelphia, February 2-5, under the auspices of the American College of Physicians. The speakers included:

Dr. George Morris Piersol, Medical Emergencies.
Dr. Hobart A. Reimann, Prophylaxis and Treatment of Virus Diseases.
Dr. Charles L. Brown, Fatigue.
Dr. George Harlan Wells, Borderline Metabolic Deficiencies.
Dr. William D. Stroud, Effort Syndrome.
Dr. Francis C. Wood, Criteria of Organic Heart Disease in Recruits.
Dr. Thomas M. McMillan, Forms of Cardiac Derangement.
Dr. John M. Bachulus, lieutenant commander, U. S. Navy, Lakehurst, N. J., Cardiovascular Problems in Aviation.
Dr. Edward A. Strecker, Personality Deviations.
Dr. Earl D. Bond, Early Signs of Psychoses.
Dr. George Wilson, Traumatic Neuroses.
Dr. Baldwin L. Keyes, Malingering.
Dr. Harrison F. Flippin, Pharmacology and Toxicology.
Dr. John S. Lockwood, Surgical Infections.
Dr. John A. Kolmer, Medical Infections.
Dr. Charles A. W. Uhle, Urinary Tract Infections.

On Friday, February 2, the day following the completion of the course, the fourth annual round-up or regional meeting of members of the college from Eastern Pennsylvania, Delaware, and Southern New Jersey was held.

SOUTH CAROLINA

Personal.—Dr. John W. Corbett, Camden, has been chosen the first honorary member of the South Carolina Tuberculosis Association.——Dr. John H. Mathias, Lexington, has been appointed chief of emergency medical service for Lexington County.

Hospital News.—Approval has been given to construction of a fourth story addition to the St. Francis Xavier Infirmary, Charleston, as a defense public works project. A federal grant of $70,000 will defray part of the expenses. The improvement will make seventy beds available at the hospital.

Society News.—Dr. Julian M. Ruffin, Durham, N. C., discussed "Diagnosis and Treatment of Ulcerative Diseases of the Colon" before the Greenville County Medical Society recently.——The Columbia Medical Society was addressed in Columbia, January 12, by Drs. Charles G. Spivey, Columbia, on "Effect of Pregnancy Urine on Certain Hypopituitary Conditions," and Samuel W. Becker, Chicago, "Allergic Aspects of Dermatology."

TEXAS

Changes in Health Officers.—Dr. Seborn C. Richardson, Bryan, has been named health officer of Bryan.——Dr. Lorence W. Feller, Fredericksburg, has been named health officer of Gillespie County to succeed the late Dr. Joseph E. Peden, Fredericksburg.

Public Health Election.—Dr. Horace E. Duncan, Dallas, health officer of Dallas County, was chosen president-elect of the Texas Public Health Association at its recent annual meeting in Corpus Christi, and Dr. Clarence Burke Brewster, Fort Worth, now on active duty in the medical corps of the U. S. Army, acceded to the presidency. Dr. Harold A. Wood, Austin, director of the Austin-Travis County health unit, and Miss Katherine King Baker, R.N., were chosen vice presidents. Alan C. Love, Austin, sanitary engineer of the Austin-Travis health unit, was reelected secretary-treasurer.

Changes in the Faculty at Texas.—Dr. Jarrett E. Williams, formerly assistant dean, Medical Branch of the University of Texas, Galveston, has been appointed associate dean and general superintendent of the associated hospitals. Dr. William S. Wallace, assistant professor of radiology, has been named assistant dean. A number of new departments have been formed at the medical school, including anesthesiology, biophysics, dentistry and stomatology, which does not deal with the mechanics of dentistry but rather with the broad relationship between medicine and dentistry. Departments of legal and cultural medicine have also been added and one on military medicine, which is oriented with aviation medicine to cover tropical medicine but which is not related to military science and tactics. The department of preventive medicine and public health has initiated a program in tropical medicine and diseases endemic in the Southwest and Old Mexico.

WASHINGTON

Hospital News.—A federal grant of $476,000 has been given to Bremerton for a new hospital with a capacity of about one hundred and sixty beds.——A new wing will be added to the United States Naval Hospital, Bremerton, at a cost of about $151,000.

Annual Meeting of Seattle Surgeons.—The Seattle Surgical Society held its annual meeting at King County Hospital, Seattle, January 23-24. In addition to papers by local speakers, the program included symposiums on infection, the use of blood, plasma and fluids, head and neck injuries and gynecologic relaxations. The guest speaker at the meeting was Dr. Frank R. Menne, professor of pathology and head of the department, University of Oregon Medical School, Portland, who participated in the general program and delivered the banquet address on "Lymphosarcoma of Small Intestine with Report of Two Cases Receiving Surgical Intervention."

WISCONSIN

State Health Board Reelected.—At a recent meeting, the state board of health reelected all its 1941 officers. Included are Drs. William W. Kelly, Green Bay, president; Stephen Cabana, Milwaukee, vice president, and Cornelius A. Harper, Madison, secretary and state health officer.

Dr. Seevers Goes to Michigan.—Dr. Maurice H. Seevers, associate professor of pharmacology, University of Wisconsin Medical School, Madison, has been appointed professor of pharmacology and chairman of the department at the University of Michigan Medical School, Ann Arbor, effective February 1. Dr. Seevers graduated at Rush Medical College, Chicago, in 1932.

The First Helmholz Lecture.—Dr. Anton J. Carlson, Frank P. Hixon distinguished service professor emeritus of physiology, University of Chicago School of Medicine, Chicago, delivered the first annual A. C. Helmholz Lecture, January 16, under the auspices of the University of Wisconsin Medical Society, Madison. His subject was "Some Unknown Problems in the Physiological Pathology of Aging."

Hospital Association Elects Officers.—The Wisconsin Hospital Association reelected its officers and directors at the January conference in Milwaukee with the exception of Dr. Robin C. Buerki, who in September 1941 became director of hospitals at the University of Pennsylvania and dean of the University of Pennsylvania Graduate School of Medicine, Philadelphia. Dr. Buerki was formerly executive secretary of the University of Wisconsin Medical School and superintendent of the State of Wisconsin General Hospital and the Wisconsin Orthopedic Hospital for Children, Madison. Dr. Harold M. Coon, superintendent of Wisconsin General Hospital, was chosen to replace Dr. Buerki on the association's board of directors. Dr. Edward T. Thompson, medical superintendent, Mount Sinai Hospital, Milwaukee, is secretary-treasurer.

GENERAL

Grants for Research in Poliomyelitis.—The semiannual meeting of the medical committees of the National Foundation for Infantile Paralysis will be held in New York, May 7-8. At this session all grants for research will again be considered. Applications should be filed with the foundation at 120 Broadway, New York, by March 1.

Dates Changed for College of Surgeons Meeting.—Because of the war, the thirty-second annual Clinical Congress of the American College of Surgeons will be held in Chicago, October 19-23, instead of in Los Angeles as originally planned. Headquarters will be at the Stevens Hotel. The twenty-fifth annual hospital standardization conference sponsored by the college will be held simultaneously. The programs of both meetings will be based chiefly on wartime activities as they affect surgeons and hospital personnel in military and civilian service.

Contest on Safety.—The American Museum of Safety announces a contest in an effort to strengthen the country's accident prevention program and perhaps obtain new ideas that will help promote safety and conserve man power for U. S. defense activities. Entries must reach the American Museum of Safety, Room 733, 60 East Forty-Second Street, New York, before midnight February 28. The subject for the contest is "A Plan of Action to Combat the Rising Tide of Accidents in the Present Emergency." Dr. Donald B. Armstrong, New York, is president of the American Museum of Safety and chairman of the Seamen Award Committee, which sponsors the contest.

Holiday Accidents.—According to a survey by the Associated Press, a total of two hundred and sixty-five persons died over the New Year's holiday in automobile accidents, drownings, falls, shootings and by other violent means. Automobile accidents accounted for one hundred and seventy-one of the total. A similar survey showed a national total of four hundred and thirty-one for the Christmas holiday, of which three hundred and thirty-four deaths were in traffic. Ohio recorded the largest New Year's state total of twenty-six deaths, twenty-two of which were in traffic accidents. Illinois' total was twenty-four and New York's twenty-one.

Annual Report of Plotz Foundation.—The Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation in its eighteenth annual report covering 1941 announced that sixty-seven applications for grants were received by the trustees, forty-nine of which came from seven different countries in Europe, South America and Central America. In the year just ended thirty-five grants were approved, one of these being a continued annual grant. In its eighteen years the foundation has made four hundred and twenty-nine grants, which have been distributed to investigators in Arabia, Argentina, Austria, Belgium, Brazil, Canada, Chile, China, Czechoslovakia, Denmark, Egypt, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, India, Iraq, Italy, Latvia, Lebanon, the Netherlands, North Africa, Norway, Palestine, Peru, Poland, Portugal, Rumania, South Africa, Sweden, Switzerland, Syria, Venezuela, Yugoslavia and the United States. The grants have assisted specific studies in a broad range of medical research.

Syphilis Test Required of Employees.—A recently completed survey shows that more than half of the largest industrial plants in the country are including a routine blood test for syphilis in employee physical examinations, according to the American Social Hygiene Association. More than two hundred large plants in forty-three states answered questionnaires sent out by the association. These plants represent many types of industry and have at least one thousand employees. Two thirds of the companies requiring these tests maintain the policy of accepting infected applicants if they are not infectious, are not disabled and will take treatment. The association states that this policy is even more liberally interpreted for infected workers already employed, three fourths of the companies retaining their employees with the usual provision that they are not to work while infectious and must take adequate treatment. The association believes this a major public health contribution because such measures insure employee confidence and aid case holding by assuring workers that they will not lose their jobs provided they take treatment.

Handicapped Employees Useful.—A study of the experience of sixty-eight industrial companies with handicapped employees reveals that careful selection procedures and placement have been uniformly favorable. According to the Conference Board, New York, nearly one third of these companies employ illiterates, while one fourth employ ex-convicts and workers with physical defects. One company reported that it

had about eighteen thousand physically defective persons on the payroll. Another said that persons who have defective hearing are often superior for inspection work. The survey showed that among employers the principal obstacles to the employment of ex-convicts are the belief that most ex-convicts do not desire to rehabilitate themselves, the practice of hiring only those persons who can be promoted to positions of responsibility, the belief that ex-convicts cannot qualify and the fear that ex-convicts would be objectionable to fellow employees. The survey was designed to show that the estimated 6,000,000 adults in the United States who are handicapped by lack of education, physical defects or criminal records may with careful planning be put to gainful employment.

Physicians Swindled.—A physician in California writes that a man has been calling on physicians in California using the approach that he has a "pain around the heart" and after the visit is concluded he presents a check for more than the amount of service. The man has a mitral murmur, and the unsuspecting physician is apt to make an examination and prescribe some sort of treatment. The man has used the name John Larabee, 2021 Hearst Street, Berkeley, Calif. There is no such address. He states he is 52 years old and a radio operator. The California physician sends the following description: He is 5 feet 10½ inches tall and weighs 152 pounds; his chest measurements are 34 to 39 inches; waist, 32½ inches; patellar reflexes are exaggerated; pupil reflexes, normal; pulse 100, temperature 98, blood pressure 150/80; heart position normal, mitral systolic murmur transmitted to the anterior maxillary line; lungs normal; extremities normal. He has impacted cerumen in both ears and has pyorrhea of all his teeth. In some cases the checks have been made out to J. Larabee and signed "Howard E. Bliss." Across the face of the check is written "Compilation" with some number after it like 18 or 200; in the corner of the check it is marked "Wages." The checks are all numbered 172, irrespective of the bank they are on.

LATIN AMERICA

Personal.—Dr. Luthero Vargas, eldest son of President Getulio Vargas of Brazil and chief surgeon of the orthopedic section of Centro Medico Pedagogico Oswaldo Cruz, Rio de Janeiro, has arrived in New York, where he will start a six months study tour of orthopedic clinics in the United States, the New York *Times* reported February 3.

Congress of Tuberculosis.—The sixth Pan American Congress of Tuberculosis will be held in Havana, Cuba, in October 1943. Officers include Drs. Juan J. Castillo, Havana, and Héctor Madariaga, Havana, president and secretary, respectively. Drs. G. Aráoz Alfaro, Buenos Aires, Argentina, Clemente Ferreira, São Paulo, Brazil, and John B. Morelli, Montevideo, Uruguay, have been named honorary presidents.

Institute of Hygiene in Ecuador.—A National Institute of Hygiene has been created at Guayaquil, Ecuador; it will be housed in a new building already under construction. The International Health Division of the Rockefeller Foundation, New York, and the government of Ecuador are financing the project as well as sharing the maintenance for a five year period, after which time it is expected that the Ecuadorian government will assume complete responsibilty. There will be installed in the new building the laboratories of bacteriology, chemistry, medical researches, preparation of anti-smallpox vaccine, bacterial vaccines, anatoxins, BCG laboratory, special laboratories for epidemics and yellow fever and the like, and in future the preparation of therapeutic serums. It is also planned to have departments for general services to the public.

CORRECTION

Stipends for Young South American Graduates.—In the Buenos Aires letter in THE JOURNAL, Nov. 29, 1941, page 1906, the correspondent stated that the Pan American Sanitary Bureau, cooperating with the Rockefeller Foundation, had provided thirty-five stipends to enable young South American graduates to be trained in hospitals in the United States and that seven of these were to be "distributed by Prof. B. A. Houssay." To clarify his participation in this matter, Professor Houssay writes as follows:

The Pan American Sanitary Bureau, in connection with the coordinator of Cultural and Commercial Relations between the American Republics, has provided thirty-five stipends to be distributed in South America, seven of which were planned for Argentina to enable young graduates to be trained in the best hospital service of the United States.

Dr. Felix R. Brunot, representative of the Pan American Sanitary Bureau, visited Buenos Aires and received the applications of seventeen candidates, which were sent to the United States, where selections should be made.

Designations came from Washington and seven applicants of our country were appointed: Drs. Pedro O. Bolo, Raul Alcayaga, Luis Delfor Podesta, Emilio Araya and Jose Abel Landa from Buenos Aires, and Drs. Mario Besso Pianetto and Alfredo F. J. Cesanelli, from Rosario.

The participation of Prof. B. A. Houssay in this matter was limited, namely, to receive applications and deliver them to Dr. Brunot, on his request. He had no intervention at all in the selection of the candidates.

Government Services

Federal Grants to Assist Hospital Expansion

Announcement is made of a series of Defense Public Works projects which have been approved under the Lanham Community Facilities Act. One unit will be constructed in Charleston, S. C., at an estimated cost of $675,000 with the capacity of one hundred and forty beds. A one story health center building will be erected in Hattiesburg, Miss., at an estimated cost of $22,000. The new unit will house the Forrest County Health Department. The Warren A. Candler Hospital, Savannah, Ga., will add a new twenty-five bed addition with equipment. The estimated cost is $93,398. A one story health center building will be erected in Starke, Fla., at an estimated cost of $33,000. These projects have been approved to expand local facilities, which have been found inadequate with the increased defense activities.

New Commission to Study Vital Statistics

A national commission on vital records has been created as a special committee of the Health and Medical Committee of the Office of Defense Health and Welfare Services. The new commission was formed at the request of the Association of State Health Executives and the American Association of Registration Executives. Lowell J. Reed, Ph.D., professor of biostatistics and dean of the Johns Hopkins University School of Hygiene and Public Health, Baltimore, has been appointed chairman. The Health and Medical Committee decided to create the commission after representatives of the army, state registrars, state health officers, the Bureau of the Census and the U. S. Public Health Service had "described the difficulties encountered by state offices in trying to maintain efficient service to the public in the face of an overwhelming increase in demands for proof of citizenship." First attention of the new committee will be given to the problem of delayed registration of births.

Major Armstrong Awarded Medal

Major Harry G. Armstrong, U. S. Army Medical Corps, in charge of research at the School of Aviation Medicine, Randolph Field, Texas, has been named to receive the John Jeffries Award given by the Institute of the Aeronautical Sciences for his contributions to the health and efficiency of military and civil aircraft pilots. The award is named after John Jeffries, a Boston physician, who was the first American to make scientific observations from the air. Major Armstrong graduated at the University of Louisville School of Medicine in 1925. He graduated at the Army Medical School, the Army Medical Field Service School and the Army School of Aviation Medicine. According to an announcement, he established the Aero Medical Research Laboratory of the Army Air Corps at Wright Field, Dayton, Ohio, in 1934, serving as director until his assignment to Randolph Field. He was one of the first to describe accurately some specific medical results of flying, such as aeroneurosis, a kind of mental and physical fatigue experienced by fliers under certain conditions; aerootitis, an effect of high altitude and acrobatic flying on the human middle ear, and aeroembolism, a reaction similar to the "bends" suffered by deep sea divers, which affects pilots who climb to high altitudes too rapidly and without proper safeguards. Major Armstrong has done much to stimulate further research in the medical aspects of aviation and has led to the development of oxygen supply and pressurizing apparatus and other precautionary procedures for safeguarding pilots against the physical effects of military flying. His volume on "Principles and Practice of Aviation Medicine" is the most complete textbook yet published on the subject.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec. 27, 1941.

Wartime Prescribing: The National War Formulary

All the normal activities of the country have to be subordinated to the war effort. In previous letters, changes with regard to drugs, such as extending the cultivation of medicinal herbs, formerly largely imported (THE JOURNAL, Sept. 13, 1941, p. 948), have been announced. The whole problem of drugs has been systematically dealt with by a committee appointed by the minister of health, which has compiled the National War Formulary. For prescribing under the national health insurance act this replaces the previous national formulary. Since the 1st of December it has not been considered advisable to prescribe any preparation by title only unless its formula is contained in the National War Formulary, the British Pharmacopeia or the British Pharmaceutical Code. Under the heading of "Wartime Prescribing" the new Formulary describes, in the interests of economy, some general limitations. Agar should be reserved for bacteriologic use. The prescribing of cinchona as a bitter is discouraged; quinine should be reserved for the treatment of malaria. Digitalis is best administered in one-half and 1 grain tablets of the powdered leaf. The liquid extract of ergot is not an economical preparation; the drug is best administered in tablet form. The vitaminized oil of the British Pharmacopeia has the same vitamin content as cod liver oil and in most cases is a satisfactory alternative. Economy in alcohol is essential; alternatives are suggested for preserving surgical instruments from rust and for surgical and industrial methylated spirit used to prevent bedsores. Liquid petrolatum must be prescribed with regard for economy; when oral administration is considered necessary a 25 per cent emulsion should be used, and even this sparingly. Under a defense regulation liver extracts are controlled; they must be administered only in pernicious or other megalocytic anemia and then only by injection. Malt extract and preparations containing it should be prescribed only for children and tuberculous patients. Phosphorus is wanted for munitions. Therefore phosphoric acid has been replaced by hydrochloric acid, hypophosphites and glycerophosphates have been excluded, and sodium acid phosphate remains for use only in association with methenamine. Potassium salts should be prescribed only when the corresponding sodium salts are not satisfactory. As this holds in the case of potassium chlorate and acetate, they have been retained.

Prescribers are asked not to order confections and lozenges, which require sugar. Dextrose is rarely necessary except for intravenous and rectal administration. Sulfanilamide, sulfapyridine and sulfathiazole are included in the new formulary, but sulfanilamide is declared to be the most generally useful and should be prescribed unless there are specific indications for either of the others. Economy is enjoined in the use of salicylic acid, salicylates, mercury and its compounds, scopolamine and atropine. The use of distilled water should be restricted to applications for the eye and those which, in the opinion of the pharmacist, would be undesirably altered if ordinary potable water should be used. Proprietary preparations of foreign origin should be avoided; in any case many of them are unobtainable.

One difference in the new formulary is reduction of glycerin in the making of preparations. Certain capsules, such as those of ergot, oil of santal and preparations of iron, are omitted. Tablets and pills are declared to be generally preferable to capsules. But capsules of vitamins A and D and of halibut liver oil have been added. Four flavoring and sweeting emulsions—aniseed, aniseed with peppermint, chloroform and peppermint alone—replace alcoholic preparations. For intrauterine use a solution containing 25 per cent of glycerin and 10 per cent of sodium chloride is introduced in place of pure glycerin.

In the mixtures quassia replaces gentian, and sodium sulfate replaces magnesium sulfate. Alcohol is reduced everywhere and glycerin is excluded; hydrochloric acid replaces phosphoric acid; extract of licorice for sweetening is removed or reduced. Bismuth mixture is entirely discouraged, and mixtures containing magnesium trisilicate and carbonate or kaolin replace it.

It should be noted that what is laid down in the National War Formulary is advisory, not compulsory. The physician can still order what he thinks best for his patient, but he is subject to the limitation that certain drugs and preparations are no longer obtainable. Further, the panel physician, prescribing under the national insurance act, has had his formulary altered. If not satisfied with a prescription in the new formulary, he can prescribe according to the old one, but instead of a ready made formula he will have the inconvenience of writing the prescription in full.

International Hospital Collaboration

The king of Norway, the grand duchess of Luxemburg, Dr. Bénès, lately president of Czechoslovakia, the prime minister of the Netherlands, the Belgian ambassador, the ministers of Norway, Venezuela and Colombia, representatives of Poland, Yugoslavia, Greece, Palestine, Iraq, Egypt, Abyssinia, India and China and the British minister of health were present at a conference held in London to consider the position of hospitals the world over when peace comes. The conference was summoned by the United Kingdom Council of the International Hospital Association. Prof. A. T. Jurasz, dean of the Polish Faculty of Medicine in the University of Edinburgh, opened a debate on the collaboration which must follow the war among all nations prepared to work together on a basis of honesty and friendliness. Some nations would have to amend the condition of their minds before they could be accepted. He suggested a greater exchange of personnel, both lay and medical, a six months residence in the larger hospitals for graduates of different countries on a principle of international exchange, an interchange of specialists and an extension of postgraduate teaching. Professor Loewy of Czechoslovakia suggested a "health union" among European countries on the basis of the curative resources of each country, such as mountain sunshine or medicinal springs, and the distribution of patients without regard to national boundaries. Dr. E. J. Bigwood, chairman of the Belgian commission for the study of postwar conditions, stated that governments of the allied countries now in London had already considered a plan for immediate relief after the war and for long term development.

HOSPITALS IN ENGLISH SPEAKING COUNTRIES

Mr. McAdam Eccles (surgeon), chairman of the United Kingdom Council, who presided, opened a discussion on the special needs of English speaking countries. He suggested that the total number of beds required in any area and the expected number of outpatients should be computed and the annual cost calculated and announced to the local community, who, he did not doubt, would provide it voluntarily. Mr. H. S. Souttar (surgeon) referred to the sweeping away of the divisions between voluntary (supported by voluntary subscriptions) and municipal hospitals. Mr. Ernest Brown, minister of health, mentioned the close relation between Britain and the United States in connection with the Emergency Hospital Service (established for the care of civilians injured in the war). The United States not only had given material help but had lent medical and nursing personnel. The Emergency Hospital Service had assumed a shape which had made possible adaptation to war needs of all kinds of existing hospitals and services.

Medical War Relief

In September 1940 a medical war relief fund was established to give temporary assistance to British physicians and their dependents who were in financial straits as a result of war conditions. An appeal for funds was made to British physicians and medical organizations with the result that $170,000 was raised in the first year. In addition to this sum $22,500 has been received from the British Medical Association of Australia, $1,500 from the Malaya branch of the association and $1,750 from British Columbia. The fund has to provide not only for cases arising out of regular warfare but also for those arising from the indiscriminate attacks from the air on our cities and towns.

A report of the first year's work of the fund shows the kind of tragedies in which physicians and their families have been involved. In 5 cases the beneficiaries of the fund are dependents of physicians killed on active service with our forces. An equal number of awards have been made in cases of four physicians killed and one disabled while engaged in civil defense duties or ordinary civil practice. Sixteen physicians helped were in difficulties resulting from the bombing of their homes or offices, with destruction or damage to their cars, furniture, instruments or other possessions. In 7 cases assistance was given to physicians temporarily in difficulty owing to loss of patients through evacuation and in 8 cases to physicians in financial straits caused by reduction in income as a result of joining the fighting services or who required help in reestablishing themselves in their practices after relinquishing their commissions on grounds of ill health. Grants to widows and other dependents of physicians have always taken the form of gifts, and in many other cases this seemed to be the only appropriate form of help. Those whose difficulties seemed likely to be only temporary requested and received loans.

The distribution committee has worked in cooperation with the Royal Medical Benevolent Fund, which was established a century ago for the relief of distressed physicians and their widows and orphans, for whom it provides annuities in the more urgent cases when the applicant is above the age of 60. This fund, with its long experience, has proved most helpful to the War Relief Fund. When widows with young children have been voted sums toward educational expenses over a period of years the Benevolent Fund, so experienced in such matters, has undertaken the administration with discretion to vary the instalments.

The British Journal of Surgery

Professor Hey Groves has resigned the position of editor of the *British Journal of Surgery*, which he has occupied for twenty-eight years, since the foundation of this periodical. A period of ill health, aggravated by enemy action, is his reason for relinquishing a task performed with high ability. He was one of the founders of the *Journal* and has shown himself a great editor of a journal which worthily represents British surgery all over the world. The project of founding the *Journal* originated in Bristol, the home of Hey Groves. The support of the leading British surgeons was secured, and Moynihan was the first chairman of the editorial committee. Hey Groves is succeeded by C. P. G. Wakeley, surgeon to King's College Hospital.

Anglo-Soviet Medical Relations

An Anglo-Soviet Medical Committee consisting of members of the medical and dental professions and students of these professions, as associate members, has been formed in England with the following objects: 1. To form a liaison between the medical professions of the two countries. 2. To exchange the latest clinical and scientific knowledge. 3. To facilitate visits of medical specialists between the two countries. 4. To give specialist advice on medical aid to the Soviet Union. The minimum subscription for associate members will be $1.25. A bulletin will be published from time to time giving reports of the committee's work. The president of the committee is Sir Alfred Webb-Johnson, president of the Royal College of Surgeons.

RIO DE JANEIRO

(From Our Regular Correspondent)

Jan. 5, 1942.

Demographic Census

The last census of Brazil demonstrated that on Sept. 1, 1940 Rio de Janeiro had 1,781,567 inhabitants. The statistics showed a decrease in births in that city. While in the 1921-1930 period the births were 344,921, in the 1931-1940 period only 321,976 births were registered, although there was an increase in the population. The deaths were 248,964 in the first period and 274,223 in the 1931-1940 period. This increase is not in proportion to the growth of the population, showing that there are better conditions of health. In the same periods the marriages numbered 80,545 and 106,112 respectively. These figures demonstrated the tendency of decrease in birth rate, although there has been an increase in the number of marriages. The last demographic census indicated that the most largely populated Brazilian cities are these shown in the table. The population of the capitals of the states was 5,661,091 in 1940, or 13.6 per cent of the population of the whole country. In 1920 this figure was only 2,473,689, or 8.6 per cent of the whole nation. This shows that the people, on the whole, prefer city life to country life.

The Most Largely Populated Cities in Brazil

	No. of Inhabitants
Rio de Janeiro	1,781,567
São Paulo	1,308,000
Recife	348,472
Salvador (Baia)	291,000
Porto Alegre	275,739
Bello Horizonte	211,650
Belem (Pará)	208,706
Fortaleza	174,855
Santos	170,000
Nitteroi	143,004
Curitiba	142,855

Brazilian Congress of Surgery

The third Brazilian Congress of Surgery was held at Rio de Janeiro on Nov. 16-22, 1941. Many surgeons came from Argentina, Paraguay, Chile, Uruguay and several Brazilian states. The official papers were read by Profs. Julio Diez of Buenos Aires, Jayme Poggi of Rio de Janeiro and Ottobrini Costa of São Paulo on the subject of surgical treatment of pain. Papers were read also by Profs. Manuel Riveros of Asúncion, Mota Maia of Rio de Janeiro and Alipio Correia Netto of São Paulo on burns. Profs. Barbosa Vianna of Rio de Janeiro and Edmundo Vasconcellos of São Paulo read papers on amputations from the functional point of view. Many other papers were read before the congress by Brazilian surgeons.

Dr. Raymundo Pires de Albuquerque proposed a new technic for temporary ligation of the appendical stump. Drs. Ney Penteado de Castro and Eurico Branco Riberio were able to show the good results obtained with the alcoholization of the hypogastric plexus as a substitute for the Cotte operation. Dr. Jassy Teixeira advocated extradural anesthesia in thoracic surgery. The problems of hyperthyroidism in pregnant women were discussed by Dr. Mariano de Andrade. Dr. Henrique Smidt spoke about the painless postoperative period, obtained by alcoholization of the mesoappendix.

PARIS

(From Our Regular Correspondent)

Dec. 31, 1941.

The New Law Against Alcoholism

A new law against alcoholism published in the *Journal officiel* of October 8 has been passed in order to lessen the drinking of apéritifs made of distilled alcohol and essences. These apéritifs are being drunk in great quantities especially in the north of France, as against the south of France, where wines predominate.

The toxicity of industrial alcohols has been proved in various experiments by Joffroy, Servaux and Picaud, who set up a table showing an increasing toxicity in the following order: ethyl alcohol, propyl alcohol, butyl alcohol, amyl alcohol. Supposing the height of toxicity to be, for instance, 1 for ethyl alcohol (wine alcohol), it amounts to 3 for butyl alcohol and to 10 for amyl alcohol.

The new law took the place of the one of Aug. 23, 1940, which restricted in France the sale of all apéritifs made of industrial alcohol. Not authorized are apéritifs made of wine containing more than 18 per cent of alcohol or more than ½ grain of an authorized essence in 1 liter. Even the so-called digestifs containing more than ½ grain of essence in 1 liter are forbidden. The board of health can interdict drinks that are considered noxious. The selling of all drinks except wine to persons under age is not allowed. All drinks except wine are to be had only on three days a week. Beverages considered authorized apéritifs and digestifs can be taken on those days only at limited hours. An exception is granted for grog, allowed to be sold from November 1 to April 1 every day at fixed hours. All publicity of apéritifs is forbidden as well as the advertisement of their supposed medical qualities.

The law does not admit the opening of new bars selling apéritifs. But even other bars selling wine or liquors can be admitted only if the authorized quota of one bar for four hundred and fifty inhabitants has not been exceeded. The alcohol problem is economic as well as medical. The alcohol problem is connected with the alimentary difficulties France is suffering nowadays. Intensive discussions are going on in the medical reviews and at the meetings of medical societies. There are physicians requesting the interdiction of all alcohol, even wine, but the latter are in the minority.

Professor Mouriqand, the vitamin specialist, discussed the toxic effect of an excess of wine in a remarkable lecture before the Medical Society of Hospitals in Lyons (Société médicale des hôpitaux de Lyon). The intoxication due to alcohol, as apéritifs and liqueurs, affects especially the assimilation of vitamins soluble in water (vitamin B_1 and vitamin C). Excess of wine, which has also a toxic effect, causes after some time a cirrhosis disturbing the assimilation of the oil soluble vitamins A, K and E, but this disturbance of the liver function can also hinder the assimilation of the other vitamins (B_1 and B_2). Our actual deficiency of vitamins in food requires the suppression of all agents disturbing the assimilation of vitamins.

Some time ago the review *Concours médical* summarized the principal requests of French physicians in the following way: (1) to diminish the number of bars, (2) to regulate the selling of wine by means of an individual ration card (0.5 liter for a person, 1 liter for workmen), (3) to allow the observation and hospitalization of drunkards. The Academy of Medicine has proposed similar requests recently.

Typhoparatyphoid, Diphtheritic and Tetanus Vaccine

At a meeting of the Academy of Medicine, Professor Ramon, scientific director of the Pasteur Institute in Paris, reported a new formula for the associated typhoparatyphoid, diphtheritic and tetanus vaccine. The advantage of the new vaccine is that it causes fewer severe reactions. Two modifications have been introduced. First, formaldehyde has been applied for the preparation of the typhoid and paratyphoid vaccine. Second, the number of typhoid and paratyphoid germs has been diminished. If one heats the combined vaccine to 54 C., the formaldehyde contained in the mixture seems to cause a modifying effect on the typhoid germ.

The number of typhoid and paratyphoid bacilli in 1 cc. of the new vaccine amounts to 0.7 billion Eberth's bacilli, 0.3 billion paratyphoid A, 0.5 billion paratyphoid B and 13 to 14 units each of the two anatoxins; before it amounted to 1,050 billion Eberth's bacilli, 0.7 billion paratyphoid A and 0.7 billion paratyphoid B in 1 cc. By inoculation of the new vaccine, administering in three times in intervals of fifteen days each 1 cc., 2 cc. and 2 cc., 7.5 billion germs and 65-70 units each of tetanus and diphtheria anatoxins are introduced into the body, instead of the old formula of 12 billion of germs and 70-75 units of each anatoxin.

A child used to get in four injections (0.5 cc., 1 cc., 1.5 cc. and 1.5 cc.), altogether 11 billion germs and 60 to 65 units. By means of the new vaccine a child at the age of 3 to 7 years gets in three inoculations (0.5 cc., 1 cc., 1.5 cc.) with intervals of fifteen days each only 4.5 billion bacilli. A child over 7 years gets 7.5 billion, the number of germs a grown up person should get.

Several thousand inoculations of school children have been performed without any noxious sequels. Thousands of young people have also been vaccinated. The local reaction is inconsiderable and the general reaction seldom causes the temperature to rise above 39 C. (102.2 F.). The maximal temperature is reached six to twelve hours after vaccination, and it usually recedes in twenty-four hours.

According to the serologic tests among vaccinated persons the new vaccine has the same immunization qualities as the vaccine formerly used. Inoculation with this vaccine is obligatory for certain groups of the population.

Death of Prof. Francis Rathery

Professor Rathery, who died some months ago at the age of 64, was well known in France through his most remarkable researches on kidney physiology and pathology, realized partly with his master Castaigne. His contributions to the treatment of metabolic diseases such as rheumatism, gout and especially diabetes and to the effect of insulin gained renown in France and all other countries. He displayed profound knowledge of metabolic diseases. In 1936 he lectured on the spa treatment of diabetes at the International Congress of Medical Hydrology, Climatology and Geology at Belgrade. In 1926 he was appointed professor of pathology at the Faculty of Medicine of Paris, succeeding Professor Roger. He became a member of the Academy of Medicine in 1932 and was appointed vice president of the Biologic Society in 1937. He was general secretary and later on president of the Association of Physicians in Paris.

Marriages

DAVID JULIAN SOBIN, Carsonville, Mich., to Miss Florence Markle of Winnipeg, Man., Canada, in Detroit in September 1941.

EMERSON LOUIS MEYER to Miss Addie Marie Grant, both of Healdsburg, Calif., Aug. 31, 1941.

JOHN F. LUBBEN JR., Dallas, Texas, to Miss Virginia Breeding in Houston, Nov. 22, 1941.

LOUIS D. BOSHES to Miss Rhea Amber, both of Chicago, January 4.

FRANK A. CALDERONE to DR. MARY STEICHEN, both of New York, Nov. 26, 1941.

Deaths

Isadore Julius Wolf, Kansas City, Mo.; Ludwig-Maximilians-Universität Medizinische Fakultät, Munchen, Bavaria, Germany, 1887; at one time lecturer and professor of medicine at the University Medical College, Kansas City; professor emeritus of medicine at the University of Kansas School of Medicine, Kansas City, Kan.; member of the Missouri State Medical Association; on the staff of the St. Joseph's Hospital; president of the staff of the Menorah Hospital, 1936-1937; consulting physician, Kansas City General Hospital; author of "A Family Doctor's Notebook," 1940; aged 77; died, Dec. 17, 1941, of cerebral hemorrhage.

John T. Farrell ● West Warwick, R. I.; Jefferson Medical College of Philadelphia, 1886; an Affiliate Fellow of the American Medical Association; president of the Providence Medical Association, 1913-1914; past president of the New England Roentgen Ray Society; formerly on the staff of St. Joseph's Hospital, Providence; was a member of the consulting staff of the Charles V. Chapin Hospital, Providence; aged 83; died, Oct. 13, 1941, of nephritis, uremia and arteriosclerosis.

Arthur Hutchinson Terry, Patchogue, N. Y.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1882; member of the Medical Society of the State of New York; past president of the Suffolk County Medical Society, the Associated Physicians of Long Island and the Southside Long Island Clinical Society; formerly member of the board of education; aged 84; died, Dec. 26, 1941, of lobar pneumonia.

Michael A. Dailey ● Colonel, M. C., U. S. Army, Baltimore; Harvard Medical School, Boston, 1907; was commissioned a first lieutenant in the medical corps of the United States Army in 1912; was promoted through the various grades to that of colonel in 1932; served during the World War; fellow of the American College of Physicians; aged 59; died, Oct. 27, 1941, of injuries received in an automobile accident.

Joseph Dempsey Thompson, Port Arthur, Texas; Memphis (Tenn.) Hospital Medical College, 1906; member of the State Medical Association of Texas; past president of the Calcasieu Parish (La.) Medical Society; formerly a member of the United States Public Health Service; aged 62; at one time on the staff of St. Mary's Hospital, where he died, Dec. 25, 1941, of hypertension and cerebral hemorrhage.

Charles Van Wood, Cedartown, Ga.; University of Tennessee Medical Department, Nashville, 1896; member of the Medical Association of Georgia; past president and vice president of the Polk County Medical Society; on the staffs of the Hall-Chaudron Hospital and the Cedartown Hospital; aged 66; died, Dec. 23, 1941, of carcinoma of the stomach.

Merle Dunning Pierson, Detroit; University of Michigan Medical School, Ann Arbor, 1922; member of the American Academy of Pediatrics; aged 50; on the staff of the Children's Hospital; secretary of the medical executive committee and member of the pediatric staff of the Woman's Hospital, where she died, Dec. 20, 1941, of tuberculous meningitis.

John H. Bong, Jasper, Minn.; Minneapolis College of Physicians and Surgeons, 1897; member of the Minnesota State Medical Association; formerly president of the local board of health; mayor of Jasper; aged 69; died, Dec. 13, 1941, in Pipestone of cellulitis of the right arm and streptococcic septicemia.

Lawrence Beaucham Owens, Columbia, S. C.; Medical College of the State of South Carolina, Charleston, 1893; member of the South Carolina Medical Association; mayor of Columbia; on the honorary staff of Columbia Hospital; aged 74; died, Dec. 9, 1941, of coronary thrombosis following pneumonia.

Miles J. Lewis, Marion, Ind.; Medico-Chirurgical College of Philadelphia, 1897; member of the Indiana State Medical Association; past president of the Grant County Medical Society; aged 66; on the staff of the Marion General Hospital, where he died, Dec. 31, 1941, of cerebral hemorrhage.

Eugene Graham Mattison, Pasadena, Calif.; University of Southern California College of Medicine, Los Angeles, 1906; fellow of the American College of Surgeons; was on the consulting staff of the Collis P. and Howard Huntington Memorial Hospital; aged 60; died, Nov. 30, 1941.

Donald Thomas MacPhail ● New York; Medico-Chirurgical College of Philadelphia, 1896; served during the World War; visiting surgeon, Manhattan Eye, Ear and Throat Hospital and the New York Eye and Ear Infirmary; aged 70; died, Dec. 16, 1941, of coronary occlusion.

Frederic Erskine Montgomery, Forest Hills, N. Y.; George Washington University School of Medicine, Washington, D. C., 1904; served during the World War; aged 59; died, Dec. 28, 1941, in St. Luke's Convalescent Hospital, Greenwich, Conn., of coronary disease.

Charles Wilson Johnson, McLeansboro, Ill.; Barnes Medical College, St. Louis, 1899; veteran of the Spanish-American War; county sheriff; at one time contract surgeon in the U. S. Army; aged 68; died, Dec. 23, 1941, in Jefferson Barracks, Mo., of arteriosclerosis.

Eugene Keene Jaudon, Miami, Fla.; Medical College of the State of South Carolina, Charleston, 1896; served during the World War; aged 74; died, Dec. 19, 1941, in the Veterans Administration Facility, Bay Pines, of myocardial insufficiency and coronary arteriosclerosis.

James Cox Markoe, St. Paul; Jefferson Medical College of Philadelphia, 1882; member of the Minnesota State Medical Association; past president of the Ramsey County Medical Society; aged 85; died, Nov. 28, 1941, of uremia, arteriosclerosis and heart disease.

Harry Benjamin Davis ● Kansas City, Mo.; University of Louisville (Ky.) Medical Department, 1908; member of the American Academy of Ophthalmology and Otolaryngology; served during the World War; aged 58; died, Nov. 23, 1941, of heart disease.

William Roland Butler, Crystal City, Texas; University of Arkansas School of Medicine, Little Rock, 1901; member of the State Medical Association of Texas; aged 75; died, Oct. 21, 1941, of hemiplegia, uremia and carbuncle.

Frank Lincoln Tozier, Fairfield, Maine; University of Vermont College of Medicine, Burlington, 1901; member of the Maine Medical Association; aged 72; died, Oct. 1, 1941, of diabetes mellitus and gangrene.

Harris Chaim Flinder, Baltimore; Russian University of Warsaw Faculty of Medicine, 1886; Baltimore University School of Medicine, 1902; aged 75; died, Nov. 20, 1941, in the Sinai Hospital of heart block.

Leonidas V. Smith, Floydada, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1906; aged 61; died, Oct. 6, 1941, in the Plainview (Texas) Hospital of diabetes mellitus.

C. Frank Hertzog, Oley, Pa.; Medico-Chirurgical College of Philadelphia, 1889; member of the Medical Society of the State of Pennsylvania; aged 76; died, Nov. 4, 1941, of carcinoma of the rectum.

Phonrose Lewis Gardner, Kansas City, Mo.; University Medical College of Kansas City, 1905; member of the Missouri State Medical Association; aged 61; died, Dec. 1, 1941.

John Chiavetta, Phoenix, Ariz.; Rush Medical College, Chicago, 1935; member of the Arizona State Medical Association; aged 38; died, Oct. 21, 1941, of streptococcic pneumonia.

Charles Byron Porter, Old Town, Maine; University of the City of New York Medical Department, 1880; aged 86; died, Oct. 7, 1941, in Bangor of hypostatic pneumonia.

Emma Caroline Lafontaine, San Francisco; Cooper Medical College, San Francisco, 1887; member of the California Medical Association; aged 77; died, Nov. 16, 1941.

James Brown Graff, Worthington, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1910; aged 58; died, Oct. 13, 1941, of chronic myocarditis.

Samuel Brown Gray, Pennsville, Pa.; Jefferson Medical College of Philadelphia, 1909; aged 55; died, Oct. 3, 1941, of cerebral hemorrhage and hypertension.

Victor Percy Fleming, Tujunga, Calif.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1916; aged 52; died, Nov. 18, 1941.

Thomas Bertram Williams, Glendale, Calif.; Stanford University School of Medicine, San Francisco, 1925; aged 41; died, Nov. 28, 1941.

Robert Everett Redmond, Jackson Center, Pa.; Miami Medical College, Cincinnati, 1882; aged 85; died, Oct. 14, 1941, of myocarditis.

Clarence V. Ward, Indianapolis; Kentucky School of Medicine, Louisville, 1900; aged 67; died, Nov. 7, 1941, of coronary occlusion.

Don Creed Wills, Arrington, Va.; Medical College of Virginia, Richmond, 1918; aged 68; died, Nov. 23, 1941, of bronchopneumonia.

Guy McKevitt Johnson ● Los Angeles; Northwestern University Medical School, Chicago, 1908; aged 66; died, Nov. 15, 1941.

Correspondence

CARE OF AVIATION PERSONNEL

To the Editor:—Referring to the article entitled "A Panoramic Sketch of the United States Army Medical Service Today" by Joseph R. Darnall, M.D., Lieutenant Colonel, M. C., U. S. Army, Washington, D. C., appearing in THE JOURNAL, Dec. 20, 1941, I would mention the School of Aviation Medicine located at Randolph Field, Texas, the medical service with the Air Corps, with its group and squadron aid stations, and the Aero-Medical Research Laboratory, Wright Field, Dayton, Ohio. The paramount role that the air forces are now playing in this war should be included in any attempted portrayal of the medical service of the United States Army.

In the last war it was learned that in the selection, maintenance and care of flying personnel the average medical officer is no more professionally equipped to discharge these duties than the average expert chauffeur is to pilot an airplane. It was soon learned that in order to equip a medical officer for his duty as a flight surgeon it was necessary that he have special knowledge of physiology, neurology, psychology, cardiology, ophthalmology, otology and organic chemistry, particularly applicable to aviation medicine. As a result of the investigations carried on and the practical application of the knowledge gained, the U. S. Army Air Corps enjoyed a much smaller mortality rate among fliers toward the end of the war than did our allies, who were slow to follow our example.

After the war and for several years the School for Flight Surgeons was located at Mitchell Field, New York, and then moved to Brooks Field, Texas, where was located our primary flying school. When Randolph Field was opened the school, then known as the School of Aviation Medicine, was moved to this new field—the West Point of the Air.

It has been a constant struggle on the part of a few medical officers to maintain the spark of life in the School of Aviation Medicine over the period of lean and unsympathetic years from the ending of the last war to the present, and it is small wonder that its existence has been overlooked. Our air force was permitted to dwindle to a deplorable state, and the School of Aviation Medicine suffered likewise. It was necessary to rob Air Corps stations of needed personnel in order to maintain a staff of instructors at the school. The general importance of this branch of medicine may be realized by the fact that the Navy detailed medical officers to this school for several years and until they established their own School of Aviation Medicine.

Today the great need for flight surgeons is beginning to be manifested, and tremendous effort is being made, with facilities which are still none too adequate, to train rapidly a sufficient number of flight surgeons to meet our present and future needs.

The special training given medical officers at the School of Aviation Medicine is in the nature of a postgraduate course and stresses the practical application of the various subjects taught there as preventive medicine. That is to say, the flight surgeon applies his knowledge in a practical manner to the preservation of the mental and physical condition of the flying personnel. The flight surgeon is well acquainted with the effects of a lack of oxygen, resulting in "anoxia," the effects of rapid ascent to high altitude, resulting in hematoaeroemphysema and the effects of extragravitational forces, resulting in "amaurosis" and syncope. He knows the cause and effect of fatigue in flying personnel and the cause and effect of nervous and mental strain and indoctrinates this personnel in all particulars and practical measures for the prevention of untoward symptoms and consequences. He is trained to detect early symptoms of nervous, mental or physical fatigue in his flying personnel and to take steps to relieve these conditions before the breaking point is reached.

He knows that the capabilities of the modern military aircraft far exceed the physiologic limits of man and that the efficiency of the airplane is equal only to the efficiency of its operating personnel, and it is his duty to maintain the efficiency of the individual members of his organization's flying personnel, whether they are command pilot, pilot, copilot, navigator, radio operator, gunner, bombardier or observer.

Much of this special knowledge has been gained through the difficult but untiring efforts of the Aero-Medical Research Laboratory located at Wright Field.

Contrary to the common belief that a flight surgeon does nothing but watch his flying personnel and fly about the country on "visits," the fact that a medical officer is rated a flight surgeon does not in any sense relieve him of the routine duties of a medical officer who is not so rated. The duties of a flight surgeon are "additional" duties. It is to be borne in mind that not all the personnel of an air force combat unit is flying personnel. In aerial combat it is not infrequent that crew members are seriously injured but able to return to their home base, where they must be treated in the same manner as casualties occurring on the ground. In air raids on air bases the flight surgeons and their enlisted assistants are apt to be suddenly swamped with large numbers of casualties. Military hygiene and sanitation have the identical standards at Air Corps bases, airdromes and installations, as do posts, camps and stations of other branches and arms of the service.

Flight surgeons are required to fly with their flying personnel in order to observe the psychologic and physical reactions of this personnel in the air and while actually under the stress and strain accompanying the various types of flights and duties performed. Frequently elements of their units will be widely dispersed, and it is necessary to travel from point to point by air to render necessary medical attention and make the necessary sanitary inspections. Frequently it is necessary for a flight surgeon to accompany patients evacuated by air and render necessary treatment en route.

It is necessary for a flight surgeon to understand from actual experience in the air what the problems encountered are and evaluate each individual flying officer and enlisted man's reaction thereto, as it is his duty to recommend the temporary relief from or the return to flying duties of all such personnel, based on their mental and physical fitness.

It may be easily surmised that a medical officer or any one else who has no knowledge of the various duties and problems arising and confronting flying personnel would be extremely presumptuous to recommend relief from or retention to flying of this personnel, which has been specially trained in these duties at tremendous expense to the government. On the other hand, a medical officer who by his training and diligence is enabled to remove from flying, temporarily, an individual who is about to become a total loss, by proper action rehabilitate that individual and finally return him to an extended period of the duty for which he has been trained is not only accomplishing an important economical saving for the government but also actually saving lives. Flight surgeons are indeed cheap insurance when, by their efforts, they may prevent the crash of a single four motor bomber, the loss of which means not only valuable lives from a military standpoint but also hundreds of thousands of dollars in equipment.

At our many training stations where we are training thousands of young men as pilots, the flight surgeon must be on the alert to pick out trainees who are showing symptoms of overstrain, as it is in this category that the first and one of the

greatest stresses is placed on the future flier. With this in mind, it is of paramount importance that those trainees who are unable to withstand completely this stress be eliminated early and before they do irreparable damage to themselves and others.

It appears that we were caught "napping" at Pearl Harbor—unprepared and inadequate at Manila. We are inadequate now in the field of aviation medicine. The awakening to full "air consciousness" of the medical profession is an urgent necessity which must not be ignored.

ALLEN D. TANNEY, M.D., New York.

SPEEDING PRODUCTION OF PHYSICIANS

To the Editor:—I have read your editorial on speeding production of physicians with great interest. I certainly agree with you on the need of thinking through the implications of the accelerated plan. May I submit the following calculations as bearing on the annual production of physicians under the two plans:

Let us assume that the total number of students enrolled in medical schools in this country (N) is approximately four times the number now graduated annually:

$$N = 4 \times 5{,}300.$$

Under the proposed accelerated plan, N students will be graduated after each three year period, or, in a period of twelve years, a total of $4N$. Under the existing four year plan the total number graduated in the twelve years would be only $3N$. Thus when the whole college-medical school system is geared to the accelerated plan the total annual production of physicians would be increased by $\frac{4N}{12} - \frac{3N}{12} = \frac{4 \times 5{,}300}{12} = 1{,}767$ physicians a year. If both colleges and medical schools become geared to the accelerated program, and if the enrolment of colleges and medical schools does not change, the increase will be accomplished without admitting any larger proportion of college graduates to medical schools than at present. If the "speed up" process should be continued long enough, either the secondary schools, the primary schools and eventually the birth rate would have to be geared into the same accelerated pace or a larger proportion than at present of students would have to be admitted to some higher level from some lower level in the educational scheme. However, I trust that the war will be over before it goes this far.

Our own faculty, I may say, has tentatively favored an acceleration plan of completing the course in three years but is still allowing two weeks for vacation at Christmas time and five weeks for vacation in the summer.

STUART MUDD, M.D., Philadelphia.

SUDDEN DEATH IN HEART DISEASE

To the Editor:—Dr. Baer's communication to THE JOURNAL, January 17, commenting on our article "The Sudden Death of Patients with Few Symptoms of Heart Disease" interests us very much because it represents the fairly typical reaction of some physicians when confronted by a proposed therapeutic regimen whose basis is physiologic experimentation. The objections offered to the use of theophylline with ethylene diamine intravenously are: "However, I feel it is not entirely just to develop the (proposed) therapeutic regimen in man"; "There are a number of additional reasons why I think the routine administration of theophylline with ethylene diamine (aminophylline) and atropine is inadvisable"; "I believe a patient with an acute myocardial infarct should have as little intravenous medication as possible."

These are not very logical objections.

It is recognized by most physicians that a powerful vasodilating drug should be given intravenously with caution to any patient, and particularly when there is known to be a recent myocardial infarction. In the case of theophylline with ethylene diamine this may be accomplished by giving the drug slowly. In our experience no ill effects have occurred in patients or dogs after the use of this drug. Usually only the initial doses are given intravenously; the others are given intramuscularly. The rationale of the therapy—namely, the protection of the uninfarcted myocardium from vasoconstrictor reflexes—requires the administration of the therapeutic agents in a manner that will assure the attainment of the objective. It is also our practice to give coronary vasodilator drugs intramuscularly or orally during the entire period of hospitalization and often for prolonged periods thereafter. Thus late ventricular fibrillation may be less likely to occur.

The concluding paragraph of Dr. Baer's letter represents a misconception of the whole purpose of our paper. He points out, quite correctly, that mortality rates for acute myocardial infarction vary from 8 per cent to 35 per cent and then argues that, since in dogs we reduced the mortality to only 25 per cent, the proposed treatment will not result in much improvement. In untreated dogs, with a complete coronary occlusion and extensive infarction of the left ventricle, the death rate was 75 per cent, and by treatment it was reducible to 25 per cent. To us this means that only one third of the animals destined to die because of myocardial infarction and ventricular fibrillation do so when the reflex mechanisms responsible for death are circumvented. In patients—most of whom have less serious infarctions—a comparable effect would result in a reduction of the mortality rate from 35 per cent to 12 per cent or from 8 per cent to 2.5 per cent, depending on which of Dr. Baer's data one uses. I am not willing to believe that this advantage "would offer little improvement over our present death rate." The experience of the Third Medical service (N. C. Gilbert, M.D., chief) at St. Luke's Hospital, Chicago, with this form of therapy amply justifies the assumptions presented here and will be reported soon.

GEORGE V. LEROY, M.D.
S. SINCLAIR SNIDER, M.D.
Chicago.

TREATMENT OF OSTEOMYELITIS

To the Editor:—The Dec. 13, 1941 issue of THE JOURNAL carries the paper of Drs. Hoyt, Davis and Van Buren in which it is said that I have always advocated some sort of drainage in cases of acute hematogenous osteomyelitis. Yet further along in the paper is a quotation from my writings in which it is specifically stated that such foci of osteomyelitis frequently go on to healing without operation of any kind. I wish to state that the latter statement is the correct point of view.

I should like to emphasize again the more and more frequent possibility of treating this form of osteomyelitis without operation and in the most conservative manner. In previous years this has repeatedly been possible in my experience without chemotherapy, and now with chemotherapy it seems as if this possibility should be accepted as almost a routine response when the condition is seen early; chemotherapy should be properly employed in sufficient dosage and for a sufficient length of time. At last nature is being given the opportunity to do things that operative surgery alone has never been able to do in the past.

A. O. WILENSKY, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, February 7, page 480.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 16-18. Acting Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARKANSAS: * *Medical.* Little Rock, June 4-5. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, June 4-5. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written.* Los Angeles, March 2-5. *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, March 18. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

CONNECTICUT: * *Medical. Examination.* Hartford, March 10-11. *Endorsement.* Hartford, March 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, March 10-11. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 22-23. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

ILLINOIS: Chicago, April 7-9. Superintendent of Registration, Mr. Philip M. Harman, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, June 16-18. Sec., Board of Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Kansas City, June 16-17. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, June 4-6. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, March 10-11. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, June 16-19. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 16-17. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, March 10-13. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: * Ann Arbor and Detroit, June 10-12. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MISSISSIPPI: Jackson, June. Assistant Sec., State Board of Health, Dr. R. N. Mitchell, Jackson.

MONTANA: Helena, April 7-8. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEW HAMPSHIRE: Concord, March 12-13. Sec., Dr. T. P. Burroughs, Board of Registration in Medicine, State House, Concord.

NEW JERSEY: Trenton, June 16-17. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 13-14. Sec., Dr. Le Grand Ward 135 Sena Plaza, Santa Fe.

NORTH CAROLINA: Raleigh, June 15. Sec., Dr. W. D. James, Hamlet.

OHIO: *Endorsement.* April 7. *Written.* Columbus, June. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, June 10-11. Sec., Dr. James D. Osborn, Jr., Frederick.

TEXAS: Galveston, March 23-25. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.

UTAH: Salt Lake City, June 29-30. Assistant Dir., Department of Registration, Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.

VIRGINIA: Richmond, June 17-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Charleston, March 2-4. Commissioner, Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, March 17. Sec., Mr. Franklin E. Roach, Science Hall, University of Arizona, Tucson.

COLORADO: Denver, March 10-11. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

DISTRICT OF COLUMBIA: Washington, April 20-21. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: Gainesville, June 8. Sec., Professor J. F. Conn, John B. Stetson University, De Land.

OREGON: Corvallis, July 11. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 18. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Vermillion, June 5-6. Sec., Dr. G. M. Evans, Yankton.

WISCONSIN: Madison, April 11. Sec., Prof. Robert N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Act: Cancer Allegedly Resulting from Trauma.—In the course of her employment in September 1938 Mrs. Webb claimed to have been struck on her right breast by a large spool of yarn. The blow caused "a little purple spot" on the breast, and by the time she returned home that evening there was "a little lump" in the bruised spot. However, she suffered no pain and continued to work until the following April, when a "lump" having developed in the breast she consulted her family physician, who made a diagnosis of cancer. She was thereafter confined to bed until her death in February 1940 from cancer. Mrs. Webb, so she stated, had never before the date of the alleged industrial accident received any injury to her breast, nor had any one in her family ever had cancer. In November 1939 Dr. Laws, who was then in charge of the case following the death of the original family physician, removed her right breast. Mrs. Webb instituted suit against her employer in January 1940 under the Tennessee workmen's compensation act, in general ascribing the cancer to the industrial accident. Specifically, she alleged "because of the blow the tissues in her breast had been torn loose and weakened and the blood cells and blood vessels therein had been damaged so that by gradual process which was not detectable, a malignant condition was developing." The trial court dismissed the suit on demurrer but the Supreme Court of Tennessee on appeal reversed the judgment of the trial court and remanded the cause for further proceedings. In the meantime, Mrs. Webb had died and the suit was revived in the name of her administratrix, and went on to trial. The trial court found for the employer on the ground that "The proof does not establish as a fact that the deceased died as a result of a cancer caused by her alleged injury. That disease is too common to attribute it to a specific cause on mere speculation." An appeal was then had to the Supreme Court of Tennessee.

The principle complaint of the appellant was that the trial court had erred in holding that the proof adduced at the trial did not establish as a fact that Mrs. Webb died as a result of cancer caused by her industrial injury and that cancer is too common to attribute it to a specific cause on mere speculation. It is the well established rule, said the Supreme Court, that in a compensation proceeding the findings of fact by the trial judge will not be disturbed by the appellate court if sustained by any material evidence. The correctness of the trial court's findings were then discussed by the Supreme Court in the light of the medical testimony adduced at the trial. Apparently the only medical witness called by the appellant was Dr. Laws, who had removed Mrs. Webb's breast in November 1939. This witness stated that medical science had never found the cause of cancer; that in many instances medical science does not know that cancer will result from certain conditions; that no one knows of any instances in which cancer has resulted from a traumatic condition but that some authorities state that it results from trauma, and that some medical authorities recognize the fact that cancer may or will in some instances result from a traumatic condition. He would not say that cancer is more likely to occur in the part of the body where there has been a trauma but that in his opinion the cancer that developed in Mrs. Webb could be attributed to the blow or bruise on her breast. Specifically he testified:

> If she got a lick there, had discoloration, probably blood under the skin, and that cleared up, I would think that was the result of the lick. I would attribute it to that any way, but nobody can say positively.

On cross examination he stated that the cause of cancer or its cure is not definitely known and that it is conjecture to say that it is. The witness was shown an article by Dr. Francis Ward, director of Cancer Research at Columbia University, entitled "Cause of Cancer," wherein it was stated, in part, that:

> The cause of cancer is not known, though there are two popular superstitions regarding it. One is, that cancer may be produced by a blow; and the other, that cancer is due to a germ. To uphold either of these there is not the slightest evidence.

The witness stated that, although he had not read the article, he "wouldn't swallow it all. That is one man's opinion." He stated that while thousands of times people have a blow, and no cancer develops, there are many instances in which it does. He illustrated his point by stating that women who have had a child are prone to cancer of the uterus, and the cause is traumatic laceration of the cervix.

Three medical witnesses were called by the employer. One, Dr. Horton, testified that in his opinion cancer cannot result from a blow. This witness agreed with the article of Dr. Ward referred to. In this connection he stated that he had read

> just last week the report of four men who have had a great deal of cancer research experience, Harvard men. They think now they have found one of the causes of cancer, which is due to the presence in the blood of free hydrocarbon, and they have examined a lot of them. The belief that trauma may cause cancer, of course, I don't know, but such has never been proven.

The claim that a blow causes cancer, this witness stated, "They claim they have discredited that belief." Another medical witness called by the employer, Dr. Cheney, testified that he had treated Mrs. Webb on several occasions in 1936, 1937 and 1938 for a tumor of the abdomen. He stated that no one knows the cause or cure of cancer, the cause of which is speculative. On cross examination, in answer to a question as to whether or not one of the theories in the medical profession as to the cause of cancer is trauma, he replied that some claim that is a theory, "I don't know. It wouldn't be my theory." Dr. Johnson, the other medical witness called by the defendant, agreed with the article by Dr. Ward on the "Cause of Cancer." He stated on cross examination that the theory that a blow, particularly on the breast of a woman, can cause cancer has been advanced on the ground that any irritation might have something to do with cancer, but such a theory has never been proven to be true. In his opinion, the cause of cancer is purely speculative and is not known.

The trial judge, continued the Supreme Court, found that the proof referred to above does not establish as a fact that Mrs. Webb died as the result of a cancer caused by the industrial injury. Three medical witnesses introduced by the employer testified, as noted, that the cause of cancer is purely speculative, that the idea that a blow on the breast could cause cancer had been advanced but never proven to be true. The only medical witness of the petitioner, Dr. Laws, stated that in effect medical science does not know that cancer will result from certain conditions or that it results from traumatic conditions. For this Court, said the Supreme Court, in view of the medical testimony, to hold that the cancer on Mrs. Webb's breast was caused by the blow she received during the course of her employment would rest in pure speculation, conjecture and guess. It was incumbent on the appellant to establish by competent and material proof that death was occasioned by an accident arising out of and in the course of her employment. Such a finding cannot be based on mere speculation or conjecture.

Accordingly, the Supreme Court affirmed the judgment of the trial court in favor of the employer.—*McBrayer v. Dixie Mercerizing Co., 156 S. W. 408 (Tenn., 1941).*

False Imprisonment: Affidavits of Physicians in Insanity Inquest Absolutely Privileged.—Ethel Dyer brought an action for damages for false imprisonment against her former husband and two physicians. She alleged that by virtue of affidavits as to her mental condition made "knowingly, maliciously and falsely" by the three defendants in a proceeding to determine her sanity held before a judge of a county court, who "was misled by these false affidavits," she was adjudged insane and committed to a state hospital for the insane, where she was forced to remain for some twenty-one days. The trial court sustained demurrers interposed by the defendants and the plaintiff appealed to the Supreme Court of Tennessee.

Apparently in the appellate proceedings there was involved only the correctness of the trial court in ruling on the demurrers of the physicians. The physicians contended that even if the statements made in the affidavits were false and were made, as charged, with malice, they were made in a judicial proceeding under oath, in response to a call for their professional opinion, and were, therefore, absolutely privileged and that no claim for damages can be based thereon. The correctness of the physicians' contentions, in the judgment of the Court, was upheld by the decision of the Supreme Court of Tennessee in *Cooley* v. *Galyon*, 109 Tenn. 1, 70 S. W. 607, reading, in part, as follows:

> There is a class of cases which are absolutely privileged, and depend in no respect for their protection upon their bona fides. The occasion is an absolute privilege, and the only questions are whether the occasion existed, and whether the matter complained of was pertinent to the occasion. In this class are embraced judicial proceedings. The proceedings connected with the judicature of the country are so important to the public good that the law holds that nothing which may be therein said with probable cause, whether with or without malice, can be slander, and, in like manner, that nothing written with probable cause under the sanction of such occasion can be libel.
>
> Applying these principles to this case, the question is not whether the words spoken by the defendant were false and malicious, but were they spoken in a judicial proceeding, and were they relevant and pertinent to the subject of inquiry in that proceeding, or responsive to questions propounded to the defendant by counsel while being examined therein as a witness? If they were, they are absolutely privileged, and the plaintiff's action must fail.

Now, said the Supreme Court of Tennessee, applying the principles set out in the Galyon case, it is apparent that (1) the affidavits complained of were made in a judicial proceeding and (2) the statements therein were pertinent to the subject of inquiry in that proceeding. The affidavits were a vital part of the judicial proceedings before the judge of the county court and the statements therein complained of, whether true or false, were directly in point on the issue for decision of whether or not the person under examination was of unsound mind. Assuming, as we must, the regularity of these judicial proceedings, the judge appointed a guardian ad litem to look after the interest of the person and examined other witnesses, as well as the two physicians on this hearing. Conceding that error was committed in the judgment and that plaintiff was thereby wronged, and that the affidavits were false, as she charged, nevertheless, for the reasons above given, she has no right of action and the action of the trial court in sustaining the demurrers interposed by the physicians was correct.—*Dyer v. Dyer, 156 S. W. (2d) 445 (Tenn., 1941).*

Society Proceedings

COMING MEETINGS

Annual Congress on Medical Education and Licensure, Chicago, Feb. 16-17.

American Association of Anatomists, New York, April 1-3. Dr. Eliot R. Clark, Dept. of Anatomy, University of Pennsylvania School of Medicine, Philadelphia, Secretary.

American Association of Pathologists and Bacteriologists, St. Louis, April 2-3. Dr. Howard T. Karsner, 2085 Adelbert Rd., Cleveland, Secretary.

American Orthopsychiatric Association, Detroit, Feb. 19-21. Dr. Norvelle C. LaMar, 149 East 73d St., New York, Secretary.

American Physiological Society, Boston, March 30-April 4. Dr. Carl J. Wiggers, 2109 Adelbert Rd., Cleveland, Secretary.

American Society for Experimental Pathology, Boston, April 1-3. Dr. Harry P. Smith, Medical Laboratory Bldg., Iowa City, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Boston, March 31-April 4. Dr. Raymond N. Bieter, University of Minnesota Medical School, Minneapolis, Secretary.

American Society of Biological Chemists, Boston, Apr. 7. Dr. A. K. Balls, Bureau of Agricultural and Engineering Chemistry, Washington, D. C., Secretary.

American Surgical Association, New Orleans, Apr. 6-8. Dr. Charles G. Mixter, 319 Longwood Ave., Boston, Secretary.

Central Surgical Association, Chicago, Feb. 27-28. Dr. George M. Curtis, Ohio State University, Columbus, Ohio, Secretary.

Federation of American Societies for Experimental Biology, Boston, March 31-April 4. Dr. D. R. Hooker, 19 West Chase, St., Baltimore, Secretary.

Pacific Coast Surgical Association, San Francisco and Del Monte, Calif., Feb. 17-20. Dr. F. L. Reichert, Stanford University Hospital, San Francisco, Secretary.

Tri-States Medical Association of the Cardinas and Virginia, Greenville, S. C., Feb. 23-24. Dr. J. M. Northington, 804 Professional Bldg., Charlotte, N. C., Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

11:797-848 (Nov.) 1941

Sputum Studies in Pneumonia: In Vivo and In Vitro Susceptibility of Pneumococci to Sulfapyridine and Sulfathiazole. A. W. Frisch, Detroit.—p. 797.

*Malignant Neutropenia Following Use of Sulfapyridine. L. M. Goldman, I. Applebaum and W. Antopol, Newark, N. J.—p. 810.

Arteriolar Changes of Skeletal Muscle in Patients with Hypertension of Varied Origin. H. E. Heyer and R. W. Keeton, Chicago.—p. 818.

Egg Albumin Complement Mixtures in Wassermann Test with Normal and Syphilitic Rabbit Serums. J. A. Kolmer, Elsa R. Lynch and Lorraine Groskin, Philadelphia.—p. 828.

Studies of Sicklemia Blood, with New Method for Its Rapid Diagnosis. W. J. Tomlinson, Santa Barbara, Calif.—p. 835.

Comparative Study of Laughlen Test, with Particular Reference to Factors of Experience and Skill in Results Obtained. M. J. Dirstine, A. W. Ratcliffe and F. B. Queen, Chicago.—p. 842.

Malignant Neutropenia After Sulfapyridine.—Goldman and his associates add 2 cases of malignant neutropenia following sulfapyridine therapy to the 28 already reported. From the data on the 30 cases they conclude that the danger of neutropenia is greater when the administration of the drug is prolonged or irregular. The histories of 13 of the 30 patients revealed that the drug had been withdrawn and then reinstated. This suggests sensitization after resumption of treatment. Eleven of the remainder received continuous treatment for ten or more consecutive days and 6 for less than ten days. Of the 12 patients who died, only 1 was given the drug for less than ten days.

American Journal of Hygiene, Baltimore

34:71-132 Section A (Nov.) 1941. Partial Index

91-148 Section B 141-168 Section C 65-80 Section D

Section A

Tuberculosis Studies in Tennessee: Prevalence of Tuberculous Infection and Disease in White and Colored Families as Revealed at Time of Investigation. Ruth R. Puffer, R. S. Gass, W. J. Murphy and W. C. Williams, Nashville, Tenn.—p. 71.

Study in Active Immunization Against Epidemic Influenza and Pneumococcic Pneumonia at Letchworth Village: II. Results of Active Immunization Against Pneumonia with Pneumococcus Polysaccharide. M. Siegel and R. S. Muckenfuss, New York.—p. 79.

Section B

Influence of Sewage Treatment on Bacterial Pollution of New Haven Harbor. G. Feldman and C.-E. A. Winslow, New Haven, Conn.—p. 91.

Types of Diphtheria Bacilli in New York City in 1940. E. Seligmann, New York.—p. 125.

Studies on Cultivation of Influenza Virus. Clara Nigg, Doris E. Wilson and J. H. Crowley, Minneapolis.—p. 138.

Section C

*Sulfathiazole as Antimalarial. L. Schwartz, W. Furst and H. F. Flippin, Philadelphia.—p. 160.

Section D

Serum Fraction with Which Antitrichinella (Trichinella Spiralis) Antibody Is Associated. Evelyn Abrams Mauss, Baltimore.—p. 73.

Sulfathiazole as Antimalarial.—Schwartz and his co-workers used sulfathiazole as an antimalarial for 9 patients who were under treatment for syphilitic meningoencephalitis with artificially induced tertian malaria. Before the antimalarial was used, from three to fifteen chills had been induced. Sulfathiazole, 3 Gm., was administered orally. The initial dose was repeated in four hours, and then 1 Gm. was given every four hours thereafter. The total dose varied from 25 to 50 Gm. Frequent blood counts, urinalyses and blood smears for parasites were made. Blood sulfathiazole levels were obtained throughout the course of chemotherapy. The chills and fever of every patient ceased after treatment with sulfathiazole. The peripheral circulation of 5 patients was apparently cleared of plasmodia. In 1 patient a relapse occurred fifteen days after sulfathiazole was discontinued and in the other 4 there have been no signs of relapse for more than ninety days. The blood of the remaining 4 patients could not be cleared of plasmodia, and the patients experienced relapses twelve, thirteen, sixteen and twenty days, respectively, after chemotherapy was terminated. No serious toxic manifestations followed the administration of sulfathiazole. Further studies of the antimalarial effect of sulfathiazole seem indicated.

American Journal of Pathology, Ann Arbor, Mich.

17:785-922 (Nov.) 1941. Partial Index

Histologic Study of Trophic Effects of Diabetogenic Anterior Pituitary Extracts and Their Relation to Pathogenesis of Diabetes. A. W. Ham and R. E. Haist, Toronto, Canada.—p. 787.

Histogenesis of Glioma Retinae: Report of Early Case with Review of Literature. K. Y. Ch'in, Peking, China.—p. 813.

Carcinoma of Ceruminous Gland. S. Warren and Olive Gates, Boston.—p. 821.

*Appendical Oxyuriasis: Its Incidence and Relationship to Appendicitis. L. L. Ashburn, Washington, D. C.—p. 841.

Foreign Body Giant Cell Granuloma of Spinal Cord Associated with Spina Bifida. B. W. Lichtenstein and J. D. Kirshbaum, Chicago.—p. 873.

Emboli of Brain Tissue in Fetal Lungs. P. Gruenwald, Chicago.—p. 879.

Appendical Oxyuriasis.—Ashburn states that in a series of 2,317 surgically removed appendixes oxyurids were found in 184 (7.94 per cent): the sectioned material of 79 was positive, and the oxyurids in 105 were found only by examining the contents expressed from the appendix. The specimens were received from the United States Public Health Service hospitals and from hospitals of the United States Indian Service. The incidence of appendical oxyuriasis among the white beneficiaries of the United States Public Health Service hospitals was 2.88 per cent, among the Indians it was 10.04 per cent and among Eskimos and Aleutians it was 23.97 per cent. The highest incidence occurred in the 7 to 11 year age group, being (for the entire series) 15 per cent for male and 22.22 per cent for female patients. Thereafter the decrease in incidence was gradual until the 32 to 36 year age group, in which a second peak occurred, 7.44 per cent for male and 15.96 per cent for female patients. Appendical infection was rare after the age of 51. Oxyuriasis occurred as frequently in the normal appendix as in the chronically inflamed one and more frequently than in the acutely inflamed appendix.

American Journal of Physiology, Baltimore

135:1-258 (Dec.) 1941. Partial Index

Warmth Sense in Relation to Area of Skin Stimulated. C. M. Herget, L. P. Granath and J. D. Hardy, New York.—p. 20.

Studies in Exercise Physiology. C. Taylor, San Francisco.—p. 27.

Observations on Return of Vascular Tone After Sympathectomy. P. M. LeCompte, Boston.—p. 43.

Adrenal Gland and Food Intake. R. A. Gout, Madison, Wis.—p. 58.

Studies on Metabolism of Pantothenic Acid in Man and Rabbits. P. B. Pearson, Dallas, Texas.—p. 69.

Some Effects of Sulfanilamide on Man at Rest and During Exercise. F. J. W. Roughton, D. B. Dill, R. C. Darling, A. Graybiel, C. A. Knehr and J. H. Talbott, Boston.—p. 77.

Permeability of Erythrocytes to Radioactive Potassium. L. J. Mullins, W. O. Fenn, T. R. Noonan and L. Haege, Rochester, N. Y.—p. 93.

Effect of Nephrectomy on Blood Pressure Response to Renin and Angiotonin. S. Rodbard, Chicago.—p. 124.

Lipocaic and Ketonemia in Pancreatic Diabetes. L. R. Dragstedt, J. G. Allen, O. C. Julian and Dorothy Stinger, Chicago.—p. 133.

Effect of Pancreatic Achylia on Vitamin K Absorption and Prothrombin Time. E. F. Sproul and E. K. Sanders, New York.—p. 137.

Exchange of Radioactive Potassium with Body Potassium. W. O. Fenn, T. R. Noonan, L. J. Mullins and L. Haege, Rochester, N. Y.—p. 149.

Influence of Diet with High Protein Content on Appetite and Deposition of Fat. E. M. MacKay, R. H. Barnes and H. O. Carne, La Jolla, Calif.—p. 193.

Observations on Localization of Receptor Area of Bainbridge Reflex. I. R. Ballin and L. N. Katz, Chicago.—p. 202.

Am. J. Syphilis, Gonorrhea and Ven Dis., St. Louis

25:659-812 (Nov.) 1941

*Antisyphilitic Treatment: Mortality Studies; Clinical, Statistical and Pathologic Analysis of Forty-Seven Fatal Reactions. R. D. Hahn, Baltimore.—p. 659.

New Aids in Diagnosis of Lymphogranuloma Venereum. G. Rake, M. F. Shaffer, New Brunswick, N. J.; A. W. Grace, New York; Clara M. McKee and Helen P. Jones, New Brunswick, N. J.—p. 687.

Lymphogranuloma Venereum Intercurrent with Other Venereal Diseases. M. F. Shaffer, G. Rake, New Brunswick, N. J.; A. W. Grace, New York; Clara M. McKee and Helen P. Jones, New Brunswick, N. J.—p. 699.

Acquired Syphilis in Childhood and Early Adolescence: Results of Contact Investigation. R. Dyar and Mary Hooke Goodwin, Baltimore.—p. 704.

Syphilis Case Finding Program in Negro Colleges. P. B. Cornely, Washington, D. C.—p. 713.

Transfer of Bismuth into Fetal Circulation After Maternal Administration of Solvisminol. H. E. Thompson Jr., L. T. Steadman and W. T. Pommerenke, Rochester, N. Y.—p. 725.

Prevention of Congenital Syphilis in Large Urban Hospital: Study of Clinic Administration. Louise B. Ingraham and N. R. Ingraham Jr., Philadelphia, in collaboration with H. Beerman, Barbara E. Spence, Virginia Arnold and Elvira M. Hassler.—p. 731.

Intravenous Vaccinotherapy in Lymphogranuloma Venereum. R. B. Greenblatt and R. Brandt, Augusta, Ga.—p. 751.

Wassermann Test: XVI. Effect of Arsphenamine and Mercury on Wassermann Reaction. D. L. Belding, Boston.—p. 759.

*Concurrent Administration of Sulfanilamide and Various Antisyphilitic Remedies in Gonorrhea and Syphilis. W. M. Brunet, N. D. Shaw and H. H. Reinhardt, Chicago.—p. 768.

Quantitative Study of Reaction of Heated and Unheated Horse Serums to Kline and Mazzini Tests. R. A. Greene and E. L. Breazeale, Tucson, Ariz.—p. 772.

Fatal Reactions Following Antisyphilitic Treatment.—Hahn states that during twenty-seven years there were 47 fatal reactions to antisyphilitic treatment and that 22 of the deaths were directly attributable to the trivalent arsenicals administered at the syphilis clinic of the Johns Hopkins Hospital. The mortality rate was 1:1,250 patients treated, with 1 death to each 12,000 injections. The mortality rate was three times as great for Negro as for white patients and twice as great for female as for male patients. The more frequent occurrence of acute yellow atrophy among women accounted for the greater mortality among women. Fifteen of 20 patients with this complication were women. Other conditions conducive to hepatic damage were present in at least 8 other patients. Fatal reactions due to dermatitis, blood dyscrasias and arsenical reactions were next in order of frequency. Arsphenamine was responsible for 50 per cent of the fatalities. Fatal reactions, with the exception of the blood dyscrasias, tended to occur after ten or less injections. It is estimated that almost one half of the arsenical reactions might have been prevented by careful consideration of the patient's general physical condition, appropriate modification of therapy, avoidance of technical errors and withdrawal of treatment when signs of intolerance appeared. This precaution could have prevented nearly all deaths due to blood dyscrasias. At the necropsy of 35 patients the most frequent anatomic observations were hepatic necrosis, dermatitis and hypoplasia of the bone marrow.

Sulfanilamide in Gonorrhea and Syphilis.—Brunet and his associates treated 44 patients who had gonorrhea and syphilis with sulfanilamide, arsenicals and bismuth compounds concurrently. A history of previous syphilitic infection was obtained from 18, only 8 of whom had received any previous treatment, which was inadequate. Of the 44 patients, 30 received 2.6 Gm. of sulfanilamide daily without any reaction, 8 were sensitive to this amount but tolerated 1.3 Gm. and 6 took the drug irregularly but still made good progress. Thirty-seven completed their tests of cure of gonorrhea, 5 defaulted before dismissal and 2 lapsed five weeks after admission. The 5 who did not complete all their tests of cure were noninfectious when last seen. Major disturbing reactions from sulfanilamide or from the antisyphilitic drugs were not encountered. One patient had a mild generalized dermatitis, but it disappeared when sulfanilamide was withdrawn, and the antisyphilitic treatment was continued. Four patients had gastrointestinal upsets following the intravenous injection of an arsenical, and anorexia, dizziness, headache and drowsiness disappeared either on the reduction in the dose or the omission of sulfanilamide for several days. The slight cyanosis of the lips disappeared when sulfanilamide was withdrawn.

Archives of Physical Therapy, Chicago

22:643-706 (Nov.) 1941

Hydrotherapy for Local Injuries and Infections. F. B. Moor, Los Angeles.—p. 645.

Functional Disorders of Foot and Their Treatment. D. J. Morton, New York.—p. 651.

*Role of Spas in Medical Preparedness. W. S. McClellan, Saratoga Springs, N. Y.—p. 656.

Cervicobrachial Syndrome. K. G. Hansson, New York.—p. 662.

Syphilis Treated with Fever Therapy in Penal Institutions. W. B. Huntley, Jackson, Mich.—p. 667.

Massage in Internal Medicine. C. J. McLoughlin, Rochester, Minn.—p. 674.

Role of Spas in Medical Preparedness.—McClellan states that if the facilities available in the spas of the United States are properly coordinated they can be used to advantage in the preparedness program. The mineral waters of the spas of the United States are of wide variety. The waters of Saratoga Springs, N. Y., contain large quantities of carbon dioxide, which is widely used abroad for the treatment of circulatory and cardiac disorders. A survey shows that there are spa facilities in thirty-three states in one hundred and three localities, with accommodations for 57,491 patients. In eighty-three localities the facilities are for less than 500 patients each, while in eleven states there are one or more spas with accommodations for 1,000 or more patients. These eleven states have approximately 85 per cent of the available facilities. With the exception of the First Army Corps Area, each area has accommodations for more than 2,000 patients. Also, in each area, except the first and the fourth, there are individual localities for 1,000 or more patients. In nearly all localities the physicians of the community can adequately direct the program for patients undergoing treatment. Many of the hotels at spas are not suitable for operation during the entire year, but selected localities could be chosen and the accommodations remodeled for year round operation. Spa facilities should not be neglected in the nation's plan for better health.

Archives of Surgery, Chicago

933-1160 (Dec.) 1941

*Clinical Use of Heparin in Peritoneum for Prevention of Adhesions: Report of Fourteen Cases. E. P. Lehman and F. Boys, Charlottesville, Va.—p. 933.

Multiple Myeloma, with Special Reference to Soft Tissue Metastasis. J. L. Donhauser and W. H. de Rouville, Albany, N. Y.—p. 946.

Physiologic Behavior of Human Appendix and Problem of Appendicitis: Reaction of Appendix to Drugs. C. Dennis, Minneapolis.—p. 1021.

Lymphosarcoma of Prostate Gland: Report of Case. W. Kaufmann and A. W. Wright, Albany, N. Y.—p. 1061.

Anterior Resection for Cancer of Rectosigmoid. J. E. Dunphy, Boston.—p. 1076.

Surgical Aspects of Pain in Abdomen in Relation to Claims for Compensation. L. R. Kaufman, New York.—p. 1086.

Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. von Lichtenberg, Mexico, D. F., Mexico; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn.; E. Wildholz, Berne, Switzerland, and V. J. O'Conor, Chicago.—p. 1094.

Heparin for Preventing Adhesions.—Lehman and Boys believe from results obtained in dogs and in 14 patients that the use of heparin for the prevention of peritoneal adhesions or for the diminution of their reformation after division is theoretically sound. The mechanism is believed to consist in the diminution of the coagulability of the serous exudate which is the response of the peritoneum to injury. However, heparin in preventing the coagulation of exudate prevents the deposition of fibrin in the cut ends of blood vessels, and without adequate hemostasis the use of heparin in the peritoneum will be associated with intra-abdominal hemorrhage. However, if all oozing points are controlled before heparin is introduced, this danger apparently ceases. An enormous number of patients must be treated with heparin before a sufficient number will be reoperated on or examined after death to provide a basis for judging the effectiveness of the intraperitoneal administration of heparin in preventing adhesions in the human being. Until greater experience has been had treatment with heparin should be limited to patients with acute partial or complete intestinal obstruction due to adhesions and particularly to those with previous operations for obstruction or repeated threatening attacks. Heparin should be used only when one is willing to accept the hazard of an insufficiently tried method in preference to a future risk of

significant proportions. Heparin should not be used in the abdomen in the presence of an oozing peritoneum after adhesions have been divided or when granulation or subacute inflammatory tissue is present, even if hemostasis is complete.

Canadian Public Health Journal, Toronto

32:539-586 (Nov.) 1941

Presidential Address to Ontario Health Officers Association. F. Ladouceur, Casselman, Ont.—p. 539.
Meningococcic Meningitis in Ottawa, 1940-1941. W. T. Shirreff, L. N. Pearlman, T. A. Lomer and Diane Croll, Ottawa, Ont.—p. 551.
Acute Anterior Poliomyelitis in Alberta in 1941. A. C. McGugan, Edmonton, Alta.—p. 559.
Health of the Worker in Industry in War Time. J. G. Cunningham, Toronto.—p. 562.
Communicable Disease Control in War Time. J. T. Phair, Toronto.—p. 565.
Incidence of Trichinosis in Humans in Toronto: Findings in 420 Autopsies. E. Kuitunen-Ekbaum, Toronto.—p. 569.
Housing and Sanitary Control in Small Urban and Rural Communities. H. McIntyre, Kirkland Lake, Ont.—p. 574.

Endocrinology, Springfield, Ill.

29:855-1042 (Dec.) 1941. **Partial Index**

Biologic Assay of Adrenal Cortical Activity. A. Grollman, Winston-Salem, N. C.—p. 855.
Further Observations on Replacement Therapy in Experimental Adrenal Cortical Insufficiency with Desoxycorticosterone Acetate and Sodium Chloride. A. Grollman, Winston-Salem, N. C.—p. 862.
Disturbed Carbohydrate Metabolism in Rats Maintained More Than a Year on Fat Deficient Diet. L. G. Wesson, Boston.—p. 900.
Rapid Method for Iodide Tolerance Determinations. A. Lein, Columbus, Ohio.—p. 905.
Thyroglobulin Studies: III. Calorigenic Action of Thyroglobulin with Different Thyroxine Content. J. F. McClendon, W. C. Foster and J. W. Cavett.—p. 927.
Synergism Between Pituitary Extracts and Chorionic Gonadotropins. H. Gusman, Atlanta, Ga., and M. A. Goldzieher, New York.—p. 931.
Experimental Hypertension and Neurohypophysis. D. G. Sattler and W. R. Ingram, Iowa City.—p. 952.
*Effects of Different Types of Ointment on Percutaneous Potency of Androgens. R. R. Greene, E. Oppenheimer, Chicago; M. W. Burrill and Dorothy Nelson.—p. 979.
Absorption Rate of Hormone Cholesteryl Pellets. M. B. Shimkin and J. White, Bethesda, Md.—p. 1020.

Percutaneous Potency of Androgens.—Greene and his co-workers used three different ointment bases for the percutaneous administration of testosterone, testosterone propionate and methyl testosterone. They demonstrated on castrated rats that the different bases variously influenced the effectiveness of the androgens. The three androgens had a still different order of effectiveness when alcohol was used as the vehicle for percutaneous administration. When administered in alcohol, testosterone was first in order of effectiveness, while methyl testosterone and testosterone propionate shared second place.

Journal of Immunology, Baltimore

42:251-368 (Nov.) 1941

Demonstration by Electron Microscope of Combination of Antibodies with Flagellar and Somatic Antigens. S. Mudd, Philadelphia, and T. F. Anderson, Camden, N. J.—p. 251.
*Relationship Between Neutralizing Antibodies Against Influenza A Virus in Serums of Mothers and Infants. E. R. Rickard and F. L. Horsfall Jr., New York.—p. 267.
Experimental Diphtheric Paralysis. Rose R. Feiner, New York.—p. 273.
Serologic Studies with Free-Living Protista. C. Tanzer, New York.—p. 291.
Studies on Mechanism of Sulfonamide Bacteriostasis, Inhibition and Resistance: Experiments with Escherichia Coli in Synthetic Medium. E. Strauss, J. H. Dingle and M. Finland, Boston.—p. 313.
Id.: Experiments with Staphylococcus Aureus. E. Strauss, J. H. Dingle and M. Finland, Boston.—p. 331.
Influence of Iron on Production of Diphtheria Toxin. J. H. Mueller, Boston.—p. 343.
Toxin Production as Related to Clinical Severity of Diphtheria. J. H. Mueller, Boston.—p. 353.
Inhibition of Bactericidal Power of Human and Animal Serums by Antigenic Substances Obtained from Organisms of Typhoid-Salmonella Group. R. J. Cundiff and H. R. Morgan, Boston.—p. 361.

Neutralizing Antibodies in Serums of Mothers and Infants.—Rickard and Horsfall determined the antibody content of the serum of 72 young mothers within a few months of delivery and of their 72 infants within twelve days to sixteen months after birth. The distribution of antibody levels against influenza A virus was similar among the mothers and their infants during the first month of life. The neutralizing capacity of the serum of only 2 infants was slightly higher than that of their mothers. A progressive decrease in the antibody level of the infants occurred during the first four months of life. The serum of no infant between 12 and 16 months of age possessed antibodies against influenza A virus. The close correspondence between the neutralizing antibody level of the serum of mothers and their infants for the first two months after birth strongly suggested that the concentration of antibodies in the maternal serum determines the concentration in the serum of the child. The fact that the concentration of antibodies possessed by infants rapidly decreased during the first four months of life and was not demonstrable at sixteen months may be taken to show that the antibodies were not produced by the child but were foreign substances which were later destroyed or eliminated.

Journal of Infectious Diseases, Chicago

69:193-286 (Nov.-Dec.) 1941

Agglutination Reaction in Tularemia. J. C. Ransmeier and C. L. Ewing, Baltimore.—p. 193.
Observations Concerning Filtration of Trypanosoma Lewisi Through Lymph Nodes. D. L. Augustine, Boston.—p. 206.
Behavior of Trypanosoma Lewisi During Early Stage of Incubation Period in Rat. D. L. Augustine, Boston.—p. 208.
Selective Bacteriostatic Effect of Slow Oxidizing Agents. W. L. Mallmann, W. E. Botwright and E. S. Churchill, East Lansing, Mich.—p. 215.
Beta Phases of Genus Salmonella, with Special Reference to Two Undescribed Salmonella Types. P. R. Edwards and D. W. Bruner, Lexington, Ky.—p. 220.
Influence of Ultraviolet Light on Equine Encephalomyelitis Virus Protein (Eastern Strain). A. R. Taylor, D. G. Sharp, Dorothy Beard, H. Finkelstein and J. W. Beard, Durham, N. C.—p. 224.
Strain of Virus Producing Meningoencephalomyelitis in Mice, with Special Reference to Pathogenesis. L. Gahagan and L. D. Stevenson, New York.—p. 232.
Arthus Phenomenon in Rat. H. B. Keston, Chicago.—p. 238.
Vitamin A Deficiency and Intestinal Permeability to Bacteria and Toxin. W. A. Stryker and Martha Janota, Chicago.—p. 243.
Hemolytic Streptococci: Studies on Carrier State in San Francisco Area, with Notes on Methods of Isolation and Serologic Classification of These Organisms. L. A. Rantz, San Francisco.—p. 248.
Dual Antibody Basis of Acquired Immunity in Trichinosis. J. Oliver-González, New York.—p. 254.
Variability in Streptococci of Group B. J. M. Sherman, Elizabeth Chase Greisen and C. F. Niven Jr., Ithaca, N. Y.—p. 271.
Experimental Study of Institutional Outbreak of Epidemic Influenza. S. E. Sulkin, J. E. Smith and D. D. Douglass, St. Louis.—p. 278.

Journal of Pediatrics, St. Louis

19:579-730 (Nov.) 1941

Bacteriostatic and Bactericidal Agents Obtained from Saprophytic Micro-Organisms. R. J. Dubos, New York.—p. 588.
Constitutional Barriers to Involvement of Nervous System by Certain Viruses, with Special Reference to Role of Nutrition. A. B. Sabin, Cincinnati.—p. 596.
Puzzles of Protein Privation: Decade of Research into Biologic Effects of Restricted Dietary Protein. A. A. Weech, New York.—p. 608.
Studies on Meningococcic Infection. N. Silverthorne and C. Cameron, Toronto, Canada.—p. 618.
Spot Maps of Bacillary Dysentery and Poliomyelitis. G. M. Lyon, Huntington, W. Va., and A. M. Price, Charleston, W. Va.—p. 628.
*Excessive Appetite: Behavior Symptom in Maladjusted Children. Eva Linn Meloan, East Providence, R. I.—p. 632.
Studies with Hemophilus Pertussis: VII. Preparation and Assay of Hyperimmune Human Serum. E. W. Flosdorf, A. C. McGuinness, Philadelphia; A. C. Kimball, Minneapolis, and J. G. Armstrong, Philadelphia.—p. 638.
Congenital Tracheoesophageal Fistula. F. P. Gengenbach and E. I. Dubos, Denver.—p. 644.
Sarcoma of Bladder in Infant. H. G. Bugbee and H. W. Dargeon, New York.—p. 656.
Congenital Hypoplastic Anemia: Case Report. C. O. Kohlbry, Duluth, Minn.—p. 662.
Histoplasmosis: Report of Case in Infant Fifteen Months of Age. E. P. Scott, Louisville, Ky.—p. 668.
The Pediatrician and the Teacher. E. O. Melby, Evanston, Ill.—p. 672.
Training of the School Physician. M. J. E. Senn, New York.—p. 677.

Excessive Appetite.—Meloan noticed that an excessive appetite was a symptom in unobese children of poor social adjustment almost as frequently as stealing, lying, physical assault and other better known behavior symptoms. A large

appetite is normal only after unusual exertion. Persistent longing for food can hardly be considered normal. Mothers frequently report large appetite as a complaint. A child steals food, steals money or works for money with which to buy food, has frequent "snacks" between meals, prowls around at night for food and consumes more food at regular meals than both the parents. The usual reaction of a parent to such a symptom is to reduce the food intake, without realizing that a needed source of emotional gratification is being removed without the supplying of something to take its place. The parent fails to recognize that food is being used as a support and as a means of overcoming or combating a disturbed mood or psychic frustration. A sudden increase in appetite is seen occasionally in children subsequent to the separation of parents, a death in the family, the birth of a sibling, a scholastic or social success of a sibling, the advent of an outsider in the home and major changes in living arrangements which curtail the child's facilities and is seen also when a child in a large family receives less recognition than his siblings. The last-mentioned situation affects children from families in which there is a dearth of social contact and cultural interest. It is also observed when a parent dwells on his or her own unhappy childhood, illnesses and dissatisfactions. The psychoanalytic interpretation of longing for food is that of an intense oral receptive tendency, the wish to be taken care of and to be loved.

Laryngoscope, St. Louis

51:983-1072 (Nov.) 1941

Available Literature on Pharynx and Pharyngeal Surgery for 1940: Review. F. E. LeJeune and P. J. Bayon, New Orleans.—p. 983.
Evaluation of Labyrinth Fenestration Operation for Chronic Progressive Deafness. E. H. Campbell, Philadelphia.—p. 1009.
Secondary Nasal Deformities Following Correction of Cleft Lip. A. A. Cinelli, New York.—p. 1053.
Foreign Body in Upper Esophagus Requiring External Esophagotomy. M. C. Myerson, New York.—p. 1059.
*Bronchoscopy Without Aid of Laryngoscope. J. Mikell, Tucson, Ariz.—p. 1063.

Bronchoscopy Without the Laryngoscope.—In approximately five hundred bronchoscopies Mikell passed the bronchoscope without aid of the laryngoscope. The larynx, the pyriform fossae and the adnexa should be examined carefully prior to bronchoscopy. After the examination the laryngoscope should be removed and only the bronchoscope passed. The author believes that the laryngoscope is required only when a tube 5 mm. in diameter or less is used or when a large amount of mucus, which blocks the lumen of the bronchoscope, is being expelled through the larynx. He is convinced that the use of the laryngoscope in bronchoscopy under other conditions is unnecessary and that it makes the procedure more difficult for the patient and for the examiner.

New Orleans Medical and Surgical Journal

94:261-310 (Dec.) 1941

*Circulatory Failure in Acute Infectious Diseases. N. J. Bender, Shreveport, La.—p. 261.
Neurosurgical Treatment of Sciatic Pain: Notes on Fifty Consecutive Cases. D. H. Echols, New Orleans.—p. 265.
Acute Mechanical Intestinal Obstruction: Dangers of Prolonged Preoperative Decompression by Means of Miller-Abbott Tube and Gastroduodenal Suction Drainage. S. A. Romano, New Orleans.—p. 270.
Bladder Insufflation as Aid in Localization of Vesicovaginal Fistula. M. L. Stadiem, New Orleans.—p. 277.
Estrogenic Hormone Therapy in Prostatic Hypertrophy. W. E. Kittredge, New Orleans.—p. 278.
Use of Sulfaguanidine in Controlled Series of Typhoid Cases. W. M. Hall, Shreveport, La.—p. 283.
Diagnosis and Treatment of Gastric Syphilis: Case Report. Grace A. Goldsmith, New Orleans.—p. 284.
Unusual Foreign Body (Fork of Bicycle Handle) in Brain: Case Report. N. L. Hart and G. C. Anderson, New Orleans.—p. 290.

Circulatory Failure in Infections.—Bender states that circulatory failure in acute infectious diseases is due to heart failure and/or peripheral circulatory failure. It is of inestimable importance to determine the exact type of failure, since the treatment of heart failure consists in careful attention to general measures, in the administration of dextrose and possibly in the use of adrenal cortex extract. In the treatment of peripheral circulatory failure measures to replenish the fluid loss in the system and to correct the abnormal physiologic state are indicated.

New York State Journal of Medicine, New York

41:2275-2370 (Dec. 1) 1941

*Goiter—Indications for Operation: How to Differentiate Toxic Goiter from Conditions Simulating It. G. W. Cottis, Jamestown.—p. 2299.
Preoperative and Postoperative Use of Iodine in Hyperthyroidism. T. B. Jones, Rochester.—p. 2300.
Thyroidectomy: Technic. F. S. Wetherell, Syracuse.—p. 2303.
Many-Stage Operation for Goiter. M. B. Tinker and M. B. Tinker Jr., Ithaca.—p. 2306.
Anesthesia in Goiter Surgery. O. H. Stover, Buffalo.—p. 2307.
Treatment of Complications of Thyroid Surgery. G. E. Beilby, Albany.—p. 2310.
Exophthalmos: Modern Views on Cause, Treatment and Prognosis. J. C. Brady, Buffalo.—p. 2313.
Streptococcic Puerperal Infection. F. L. Adair and Lucile R. Hac, Chicago.—p. 2318.
Ovarian Cancer: Clinicopathologic Evaluation. A. A. Marchetti, New York.—p. 2324.
Follow-Up Study of Arthritic Patients Treated with Activated Vaporized Sterol. R. G. Snyder and W. H. Squires, New York.—p. 2332.

Indications for Thyroidectomy.—Cottis states that two thirds of the conditions given a mistaken diagnosis of hyperthyroidism leading to unnecessary operations come under the head of anxiety, neurosis and neurocirculatory asthenia. Organic heart disease and essential hypertension account for the remainder of the mild forms of depression which between the ages of 40 and 60 constitute a danger and must be guarded against. The broad picture is one of nervousness, weakness, tachycardia, emotional disturbances, tremors and loss of weight or constant underweight. When the sensation of choking (globus hystericus) appears it is not surprising that many of the patients come to the surgeon for thyroidectomy. Unfortunately, once enlargement of the thyroid has been mentioned they are eager for operation and are, therefore, an easy prey for the incompetent or dishonest practitioner. Usually a differential diagnosis is not difficult if the following points are considered: In hyperthyroidism some enlargement of the thyroid is present. Thyroid tachycardia is constant; in neurosis it subsides during rest. The skin of patients with hyperthyroidism is warm and moist; the hands and feet of neurotic patients are usually cold and clammy. In hyperthyroidism loss of weight occurs in spite of a good appetite; in neurosis the appetite is usually poor. Patients with hyperthyroidism are usually intolerant of heat; neurotic patients alternate between sensations of heat and of cold. Few patients with hyperthyroidism fail to improve on iodine administration. Those who do fail to improve have a toxic adenoma which is easily palpable. Proper examination should lead to the discovery of organic heart disease and hypertension. In fully developed hyperthyroidism (whether due to toxic adenoma, diffuse hyperplasia or to large nontoxic goiters producing pressure symptoms) the indication for surgical treatment is no longer debatable. The decision whether or not to operate is presented by two types of patients. 1. It appears that many patients with a slight enlargement of the thyroid and mildly toxic symptoms suffer from functional rather than organic hyperthyroidism. There is often a background of domestic or financial troubles. When the psychic factor is corrected, rest and small doses of iodine and sedatives will cure many of them. Recurrences are not infrequent, but they respond to treatment. If the patient is resistant to iodine, operation is indicated before the thyrotoxicosis becomes too great for safe surgical intervention. 2. Older patients with long-standing heart disease (whether caused or complicated by toxic hyperplasia, toxic adenoma or a large nontoxic goiter) are obviously poor surgical risks. Nevertheless, in some of these bad risks, even though the thyroid factor seems debatable, operation has yielded the most brilliant results. Many patients with cardiac disease who are bedridden, who are no longer responding to medical treatment and whose refractory fibrillation is constant may be restored to usefulness by a carefully performed thyroidectomy. Furthermore, patients with paroxysmal tachycardia often respond dramatically to operation. An adenoma of the left pole extending well into the thorax should be kept in mind when such a patient is encountered.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:601-640 (Nov. 1) 1941

Correlation of Pathology, Physical Signs and X-Ray Appearances in Development of Lung Cavitation. R. R. Trail.—p. 601.
Treatment of Hallux Valgus Deformity in Soldiers. R. Brooke.—p. 605.
**"Night Blindness"—Psychophysiologic Study: Specific Psychologic Data and Characteristics. E. Wittkower and T. F. Rodger, in collaboration with G. I. Scott and B. Semeonoff.—p. 607.
Closed Plaster Treatment of Burns of Extremities. T. J. Roulston. —p. 611.
Air Raids and the Child. W. E. R. Mons.—p. 625.

Psychophysiologic Study of Night Blindness.—Wittkower and his collaborators state that of 52 soldiers complaining of night blindness only 1 had a true ocular cause for the complaint. The psychologic data for some of the others were: Another member of the family of 9 suffered from night blindness. Complete blindness in near relatives was reported by 7 and severe anomalies of refraction by 8. Thirty-eight had nervous habits: nail biting, thumb sucking, stuttering, fastidiousness about food and speech disorders. Fear of darkness was excessive in 22. Unusual fear of injury was pronounced in 28. Other fears were fear of dogs, robbers, blindness, bayonet practice, heights, enclosed places, water, fire, contamination and infection. Four men were overtly overaggressive in adolescence or in adult life. Two were criminals. The majority were unaggressive, overcompliant, soft-hearted persons. The aggressiveness of some was more or less completely repressed. Most of the men denied direct prying interests, but questioning disclosed that many of them were unnecessarily inquisitive and curious. Most of the patients were inhibited in their desire to be noticed, while 6 were happy only if they could show off. Nine men stated that they had been night blind since childhood, 16 later in life but before the war, 13 since the blackouts had started and 14 during the war. The onset was gradual in 31 and acute in 21. There was no correlation between the personality types of the men and the mode of onset. Night blindness occurred in 11 patients in the course of a nervous breakdown, and in 6 it was precipitated by terrifying war experiences. In general the night blindness, though phenomenologically the same, was etiologically distinct from that due to nutritional causes and was probably of purely psychologic origin.

Journal of Laryngology and Otology, London

56:313-336 (Sept.) 1941

Relationship of Rhinology and Laryngology to Thoracic Surgery. C. P. Thomas.—p. 313.
*Relation of Infantile Mastoiditis to Infantile Mortality. P. W. Leathart. —p. 320.

Mastoiditis and Infantile Mortality.—Leathart states that the vast majority of deaths of infants up to 1 year of age are from bronchopneumonia, lobar pneumonia, gastroenteritis and acute bronchitis, that is air-borne or food-borne infections. At postmortem examination of children undiagnosed mastoiditis is frequently discovered, almost exclusively in infants up to and about 1 year of age certified as having died from one or other of the foregoing infections. During a period of two years, postmortem examination of 60 children less than 1 year old who died from an air-borne infection and of 12 who died from a food-borne infection revealed undiagnosed mastoiditis on one or both sides in 59.6 per cent. During these two years approximately 150 infants with a diagnosis of mastoiditis were operated on, with a recovery rate of 80 per cent. All, or nearly all, these infants would have died had not operation been done and death would have been certified as due to an air-borne or a food-borne infection instead of to mastoiditis complicating the air-borne or the food-borne infection. That the diagnosis of this complication is possible, in fact easy, and operative treatment effective is shown by the case sheets of 32 infants with an air-borne or a food-borne infection and mastoiditis. The case sheets revealed that (1) the diagnosis of mastoiditis before operation was correct in every case, (2) in the majority the condition was bilateral, (3) only 2 of the children were more than 1 year old, (4) the tympanic membrane of a few showed inflammatory changes and in 2 or 3 pus was seen at the fundus, (5) all the patients were seriously ill and the gross dehydration of many was unrelieved by receiving saline solution intravenously, (6) the glands in the posterior triangle of the neck of all the children were enlarged, (7) 6 died after operation and (8) 26 recovered and left the hospital in good condition. Therefore diagnosis and treatment saved 80 per cent of these infants from death. When an air-borne or a food-borne infection in a child less than 1 year old is not improving the probability of mastoiditis should be considered. Examination with the electric auroscope may reveal a pool of pus at the fundus which is too small to appear outside. Sometimes the tympanic membrane is pink or it may be lusterless or wrinkled like crushed tissue paper. Frequently nothing abnormal is seen. There is one constant physical sign: palpable glands in the posterior triangle of the neck, behind the sternomastoid muscle. Other conditions (sepsis of the skin of the head or ear) which produce such enlargement are rarely found in children less than 1 year of age. Mastoiditis in its catarrhal or purulent stage is by far the most common cause of the enlargement in these infants and should be suspected at once. The bottle-fed infant with an air-borne or a food-borne infection and the healthy bottle-fed infant should never be fed while they are lying down. Between feedings they should be propped up and constantly turned from side to side. The adoption of these measures has definitely decreased the incidence of mastoiditis complicating air-borne and food-borne infections among the infants treated at the Royal Liverpool Children's Hospital and has also promoted spontaneous recovery in infants not ill enough to require surgical intervention.

Lancet, London

2:507-548 (Nov. 1) 1941

Some Problems of Wound Infection. A. A. Miles.—p. 507.
Pneumococcic Meningitis: Fourteen Cases with One Recovery. W. T. Cooke.—p. 510.
Id.: Recovery with Sulfathiazole. S. J. Howard.—p. 512.
Cortical Necrosis of Kidneys Complicating Perforated Gastric Ulcer. B. Godwin and A. J. McCall.—p. 512.
Bacteriologic Air Analysis by Cloud Chamber Method. S. D. Elliott. —p. 514.
Gas Gangrene of Eye. A. G. Cross.—p. 515.
Forty Cases Treated at Allendale Curative Workshop. Elizabeth Casson. —p. 516.
Location of Foreign Bodies by Radio Frequency Probe. F. T. Farmer and S. B. Osborn.—p. 517.
*Pulmonary Tuberculosis in the Services: Survey of 100 Cases. J. Aspin and R. Stalker.—p. 518.
Anterior Dislocation of Radial Head with Fracture of Shaft of Ulna. E. N. Wardle.—p. 520.
Sulfathiazole in Staphylococcic Lung Infections. G. Melton.—p. 522.
Acute Laryngitis Complicated by Recurrens Paralysis. A. J. Moffett. —p. 523.

Pulmonary Tuberculosis in the Services.—Aspin and Stalker observed 100 soldiers and airmen suspected of having pulmonary tuberculosis who were sent to a sanatorium from military hospitals and sick posts. According to the final diagnosis, 8 were nontuberculous. Of 10 who previously had been notified that they had tuberculosis only 1 deliberately concealed some essential information because he wanted to join up to get a "soft job." The others felt they were helping their country by enlisting. Eighteen others gave a history of a parent, brother or sister either being treated for pulmonary tuberculosis or dying of the disease. Three fourths of the men were conscripts whose military service amounted to less than a year. While 4 old regulars could muster sixty-four years of service among them, 12 others could not together make up six months of service. The 100 men were divided into two groups—those in whom miniature roentgenograms at enlistment would have revealed lesions suggestive of pulmonary tuberculosis and others in whom it would not have. Study at the sanatorium suggested that abnormal shadowing or displacement of the mediastinum would have been clear enough at enlistment in 46 of the 100 men to have been detected by miniature roentgenography. The stage at which the disease was diagnosed in the men did not differ materially from the stage at which diagnosis is made in civil life.

Helvetica Medica Acta, Basel

8:379-522 (Aug.) 1941

*Study of Osteopathy Due to Fluorine Poisoning. F. de Senarclens. —p. 379.
Prethoracic Esophageoplasty by New Esthetic Method with Enclosed Epithelial Graft. M. Rapin.—p. 429.
*Effect of Various Anticoagulant Solutions on Evolutive Forms of Thrombocytes. S. Sonder.—p. 436.
Relation Between Experimental and Essential Hypertension: Basis for Theory of Enzymatic Mechanism. W. Rieben.—p. 463.
Wolff-Parkinson-White Syndrome and Its Pathology. I. Mahaim. —p. 483.
Association of Roentgenology and Gastroscopy in Study of Gastroenterostomies. M. Demole, P. Godard and R. Sarasin.—p. 494.
Puerperal Mastitis: Prophylaxis and Therapy. F. Chatillon.—p. 506.

Bone Changes Due to Fluorine Poisoning.—De Senarclens points out that intoxication with fluorine, like lead poisoning, plays an important part in industrial diseases. The use of cryolite (Na_3 Al F_6, or sodium aluminum fluoride) in the production of aluminum provokes emanation of vapors which contain fluorine and exert a toxic effect on the workers. The author reviews the literature on fluorine poisoning and describes his own experiments on rabbits, rats and goats. He concludes that fluorine has a particular affinity for the skeleton and the teeth. He was unable to produce macroscopic lesions, but the microscopic lesions appeared rapidly, if the intoxication was severe. The lesions are dependent on the storage of the agent in the skeleton, if fluorine is administered in a dose which only slightly exceeds physiologic elimination. Fluorine provokes osteopathy of the osteitis fibrosa type. During the first phase a destruction (osteoclasia) takes place that corresponds to the picture of a progressive atrophy. The second phase is osseous regeneration (osteoplasia, osteosclerosis). Sodium fluoride is more toxic than is calcium fluoride because of its greater solubility. The elimination of fluorine is probably regulated by the parathyroids. The author considers various hypotheses with regard to the pathogenesis of skeletal fluorosis: the calciprivic theory, the theory of a deficiency of mineral salts or of vitamins, as well as the theory which ascribes the osteopathy to a renal lesion. The hypotheses according to which goiter and hyperemia act as pathogenic agents appear erroneous to the author. He suggests a theory which presupposes the presence of a tissue and humoral acidosis resulting in a withdrawal of salts of skeletal origin and in decalcification. Decalcification in an acid milieu takes on the character of osteitis fibrosa. The disturbances of the apposition will be due to an inhibiting action of fluorine on the phosphatase, notably on the second phase of its action (precipitation and distribution of the phosphocalcic salts). The dental lesions consist in damage to the enamel, which becomes lusterless and chalky and exhibits transverse depigmented bands. The friability and wearing away of the teeth, extreme mobility in the alveolus and lesions of the paradentosis type must be attributed to atrophy of the alveolar edges. Other organs exhibit lesions due to fluorine poisoning. Hemosiderosis of the spleen is found in the majority of animals, myocarditis in one fourth and nephrosis in a smaller number of rats and rabbits. Of the 3 goats 1 exhibited glomerular nephritis and another nephrosis. Other disorders were microfollicular goiter, testicular atrophy and chronic gastritis. Intoxication developed in a suckling kid during the administration of fluorine to its mother. Sodium fluoride provoked abortion in 1 of 2 goats.

Effect of Anticoagulant Solutions on Thrombocytes.—Sonder describes his studies on the influence exerted by different anticoagulants on the evolutive forms of thrombocytes. His aim was to find the most suitable solution for the demonstration of thrombocytes in dark field preparations. Among the substances investigated were solutions of magnesium sulfate, sodium citrate, sodium oxalate, a solution designated as liquemin, Corelli's solution, hirudin solution, Lenggenhager's solution and a solution known as liquoid. With the aid of these different anticoagulants the thrombocyte could be observed as a cell consisting of cytoplasm and granules. With the aid of magnesium sulfate diverse pictures were observed: star shaped cells, spider or butterfly shape, cells with pseudopodia with club-shaped or flail-like ends, cells with double-contoured pseudopodia, cells with short and long pseudopodia and cells in an irritative or in a quiescent state. The author found a 14 per cent solution of magnesium sulfate particularly suitable. This solution permits the clearest visualization of the active forms and their evolution. The quiescent forms can be demonstrated by a 2 per cent solution of sodium citrate and still better by a 1 per cent solution of sodium oxalate. Quiescent forms predominate if sodium oxalate solution is used. They are mostly round and exhibit almost no ameboid movements. The oxalate appears to exert a damaging effect on the thrombocytes. Liquemin solution proved especially effective in demonstrating the various phases of the elimination of fibrin needles after the addition of thrombin solution, the formation of the fibrin reticulum and the dissolving processes of the thrombocytes at the coagulation centers, probably because it has a weaker anticoagulating effect. Liquoid is entirely unsuited because of its dissolving effect on the thrombocytes. With regard to the clinical use of anticoagulants the author concludes that sodium citrate solution is best suited for inhibiting coagulation in blood transfusion; the predominance of quiescent forms seems to indicate that there is less danger of thrombosis. However, in a case of hemostatic blood transfusion liquemin is preferable because of its slight inhibiting effect on the coagulation and because it impairs the thrombocytic function less than other anticoagulants, but the rather frequent appearance of piles of thrombocytes indicates a greater danger of thrombosis.

"Gann," Tokyo

35:133-245 (June) 1941. **Partial Index**

*Experimental Production of Liver Cirrhosis by Furfural Feeding. W. Nakahara and K. Mori.—p. 208.

Cirrhosis of Liver by Furfural Feeding.—Nakahara and Mori report experiments confirming the successful production of cirrhosis of the liver by furfural feeding in rats. Furfural ($C_4H_3O.CHO$), one of the essential constituents of Japanese rice wine (saké), is a practically colorless liquid which has a boiling point of 160 to 162 C. (352 to 355 F.) and which readily polymerizes. When fed with rice in amounts varying from 10 to 50 cc. per kilogram of body weight, furfural may produce early death in animals. Generally speaking, rats fed on these amounts of furfural begin to show evidence of hepatic cirrhosis in sixty to ninety days; much smaller feedings of furfural may not lead to such a pathologic condition until three hundred to five hundred days later. The earliest change in the liver of animals so fed was the development of a granular or nodular surface, especially noticeable in the caudate lobe. While the organ tended toward paleness in color, the nodular parts, varying greatly in size, were never entirely white. When furfural is fed in small amounts over a long period of time, the cirrhotic changes are more or less localized, although the affected areas themselves are even firmer and have more irregular surfaces, as compared with those of animals fed larger amounts of the material. In experiments in which furfural feeding was discontinued after one hundred and forty-two days, the animals dying after discontinuance of the experimental diet showed increasing degrees of fibrosis; the cirrhotic areas in their livers presented firm, distinctly whitish and evenly granular or smooth surfaces. In other organs furfural feeding produced no gross changes. Histologically the early changes are dilatation of the sinusoids with engorgement and some changes in the Glisson capsules, consisting of round cell infiltration, an increase in connective tissue and a distinct proliferation of the transitional epithelial cells. The last mentioned cells appear to be the cellular element which plays a significant part in producing the ductlike structures in furfural cirrhosis. Later they produce the typical picture of annular cirrhosis, and together with the proliferation of connective tissue elements, particularly collagenous and reticular fibers, these cells reduce the size of liver lobules and divide them into coarse netlike structures. In livers with advanced cirrhosis there may occur actual tumor-like enlargement of the parenchyma tissue, composed of lobules containing hypertrophic liver cells. These typical ductlike structures frequently are irregular in size and shape, sometimes showing fantastic convolutions and enlargement of the lumens. Some of these dilated lumens, often cystic and papillar in appearance, may contain amorphous matter suggestive of products of secretion. The authors express the opinion that the cirrhotic changes produced by furfural feeding are initiated by the primary productive interstitial processes, without noticeable necrosis of hepatic cells, and are characterized by the prominent annular picture and proliferation of pseudo bile ducts.

Book Notices

Wounds and Fractures: A Clinical Guide to Civil and Military Practice. By H. Winnett Orr, M.D., F.A.C.S., Chief Surgeon, Nebraska Orthopedic Hospital, Lincoln. Cloth. Price, $5. Pp. 227, with 137 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1941.

In this purely personal review of a wide experience with traumatic wounds and fractures, Dr. Orr presents his own description of the "Orr method." The work is timely, as the "method" has been widely advocated and used during the present war emergency. In his own words, "The Orr method is not simply a matter of infrequent dressings with a vaseline pack. It calls for all the other essentials of surgical care; namely, adequate primary drainage, protection of the patient's wound against secondary infection, immobilization in correct position and good general care." The general principles which are brought forth have received wide acceptance.

The actual technic used to achieve rigid intrinsic skeletal traction and fixation should not be confused with the principles which may be termed the Orr method. Many of the opinions expressed in this work will not be accepted without argument. Widespread use of fixation and transfixation pins is advocated, but mention of their dangers is not made, particularly when such pins are used in the site of the fracture. The author uses a much more widespread type of plaster fixation than is commonly considered adequate, using double long leg plasters for compound fractures of the tibia and fibula and advocating the use of a double spica dressing even though an adequate reduction and nailing operation has been done in a fracture of the neck of the femur. No ill effects from prolonged immobilization in plaster are recorded; rather the opposite view has been taken, that joint stiffness is the result of inadequate or insufficient immobilization.

In the section devoted to the care of compound, contaminated and infected wounds, there are several opinions expressed which may be questioned. The subject of gas bacillus infection is dismissed in one paragraph with the statement "If gas bacillus infection is present, more extensive provision must be made for drainage and access of air to all parts of the wound, but otherwise the treatment is the same. Correct position of the limb and immobilization of the extremity are just as important as under less dangerous conditions." In the care of a contaminated wound, proper emphasis is laid on adequate exposure of all reaches of the wound, but a minimal amount of attention paid to the actual débridement. Dr. Orr still specifically advocates the use of iodine and alcohol used locally in the preparation of the wound for débridement. No contraindications to the use of rigid pin fixation in a closed plaster are mentioned at any point, yet in inexperienced hands the adoption of this method of therapy might well lead to serious consequences.

It is in the field of compound fractures that the present work will prove of interest, and here the basic principles of the author's method of treatment is the essential contribution of the whole book. He considers every open or compound fracture to be actually or potentially infected. If the wound is a clean one, the purpose is to repair it by aseptic surgical measures and leave it alone; for a soiled or infected wound, to clean it up surgically and provide drainage. This is done by wide open aseptic packing with a petrolatum gauze pack. The petrolatum pack is not a wick to drain the wound or a plug to fill it like a cork. The wound is not distributed or dressed unless pain, swelling, rise in temperature or high white blood cell count gives evidence of a return of inflammation in a wound or the fracture area of sufficient severity to warrant intervention. If this is necessary, the proper surgical drainage should be instituted and the same program again carried out. Rigid fixation of the fracture fragments by one means or another is an essential part of the treatment, not merely the encasement of the limb in a circular plaster of paris splint.

Proper care of traumatic wounds throughout the world has been improved through the efforts of Dr. Orr beyond question. This has been his greatest contribution to the field of surgical practice, and in this work he emphasizes over and over again the clinical principles on which his views are based. Any disagreement with the technical methods employed by others cannot detract from this fact. It must be remembered that this work presents nothing beyond the author's own experience, and many of the case reports incorporated speak for themselves.

An Account of Twelve Months of Health Defense Containing the Activities of the Health Department of the City of New York for 1940 with Comparative Vital Statistics Tables and a Review of Developments Since 1934. Edited by Savel Zimand. Fiorello H. LaGuardia, Mayor. John L. Rice, M.D., Commissioner of Health. Cloth. Price, $1. Pp. 283, with 25 illustrations. New York, 1941.

For the fourth year in succession, the Annual Report of the Department of Health of the City of New York has appeared in book form and with an editorial approach which represents something more than the traditional recital of work done, budgets allowed, citizens arrested, literature distributed, disadvantages suffered or overcome, achievements hailed and failures explained. Each of these reports has been keyed to a specific phase of health progress in the work of the department. This volume is appropriately titled to catch the current interest in national defense, in which health is an important consideration.

The book presents the various phases of the work of the health department, including the conventional divisions from vital statistics to venereal disease control. The factual tabular material is concentrated at the back of the book, where it does not interfere with easy reading of the narrative summaries of the work of the several departments yet is available when needed. Considerable tabular material which bears direct relationship to accompanying tests is found in the body of the report.

This constitutes a good report of a first class job of public health administration. Physicians reading or scanning the report will be pleasantly impressed with the numerous examples of cooperation between the department of health and the five county medical societies of Greater New York and the New York Academy of Medicine. Aside from its value as a historical record of health administration in the nation's greatest city and the interest attached to the original conception of district administration which is being experimentally worked out in New York City, this book should be useful in public health training schools for all kinds of public health personnel and should also be a reference book of tremendous value in any college or high school library, where it should serve as a rich source of information for studies and project work.

Contribution to the Knowledge of Congenital Dislocation of the Hip Joint: Late Results of Closed Reduction and Arthrographic Studies of Recent Cases. By Erik Severin. Translated from the Swedish by Helen Frey. Acta chirurgica Scandinavica, Vol. LXXXIV, Supplementum 63. Paper. Pp. 142, with 44 illustrations. Stockholm: P. A. Norstedt & Söner, 1941.

The introductory chapter of the history of congenital dislocation is well presented, though only meager recognition is given to Paci, pre-Lorenz attempts of reduction, with a review of statistical data on end results, including these of Lorenz, Lange and the latest reports of Putti (1934), Annovazzi and others. Although the author objects to statistical series which do not contain all cases treated (which seems to be hardly possible to obtain), a certain weeding out for lack of subsequent information is necessary. His statistical study is based on a material of 330 cases which remained after eliminating unsuccessful reductions, cases too old, and the like, and of this group over 90 per cent could be reexamined for the final statistics, leading to three hundred and thirty early results; but his data are valuable because of the homogeneity of his material, which is treated under the same supervision and same method throughout and the percentage of his reexamined cases is high. In his primarily successful cases the late results are based on roentgenologic data, the so-called Wiberg angle being used for the standard of normality and the x-ray end results being divided into six groups, which range from complete anatomic cure to complete redislocation. The reader will be interested in the tabulations of the late end results from the roentgenologic angle, on the observation of 306 cases with 417 hips; also in his tables on relation of age and end result in x-ray terms, especially the relation between development of femoral head and age at reduction, and the relation of deformation of femoral head to age of reduction.

Owing to the extremely critical standard, the author finds that good late results judged from the roentgenologic aspect are found in only one tenth of the cases treated with good primary results.

Chapter 6 is devoted to the development on the healthy side in 190 cases of unilateral congenital dislocation. He finds in no less than 57 of these dysplasias and subluxations, considering all cases in which the angle of inclination of the acetabular roof after the first year of life was 30 degrees or more.

A comparison of late functional results with late roentgenologic findings leads the author to the conclusion that of 448 hips treated with good primary results only about one fourth functioned perfectly five years or more after treatment, which is in contrast to Max Lange, who finds 75 per cent good function in his follow-up series.

The second part of the book is devoted to arthrographic studies made with a contrast medium, parabrodil, for which the author has worked out his special technic. Several pertinent facts are established thereby which otherwise would escape observation, for instance, relationship of the cartilaginous limbus to the head and the ligamentum teres. Especially the degree of penetration of the head into the acetabulum after reduction and progressive changes in such penetration are beautifully illustrated by a number of excellent roentgenograms.

The monograph is well written, carefully prepared both from the historical and the observational angle and excellently illustrated. The x-ray studies of the second part are particularly attractive.

Infant Nutrition: A Textbook of Infant Feeding for Students and Practitioners of Medicine. By Williams McKim Marriott, B.S., M.D. Revised by P. C. Jeans, A.B., M.D., Professor of Pediatrics, College of Medicine, State University of Iowa, Iowa City. Third edition. Cloth. Price, $5.50. Pp. 475, with 31 illustrations. St. Louis: C. V. Mosby Company, 1941.

This is a treatise on modern infant feeding and nutrition based on sound physiologic and chemical principles. In keeping with modern advances in science, various chapters have been rewritten. The chapter on vitamins is particularly important. The present exploitation of vitamins has left the public, and the practitioner as well, greatly confused. Marriott and Jeans review the subject thoroughly and concisely. Their view that excessive doses of vitamin D retard growth and that concentrated preparations are less efficiently utilized is significant. The chapter on cow's milk now includes a discussion of the low curd tension and soft curd milks which are frequently used in the artificial feeding of infants. The chapter on the diet of the normal infant is a discussion in greater detail with respect to the advantage and disadvantage of feeding various foods based on the nutritional requirements of the infant. The chapter on celiac disease possibly could be more complete in its discussion of the diagnosis with particular reference to cystic disease of the pancreas and the possible factor of food allergy in the celiac syndrome. A new chapter briefly discusses allergy in relationship to infant feeding. The value of sulfanilamide and its derivatives in the treatment of various infections is discussed. The chapter on rickets, tetany and scurvy has been enlarged to include the more recent methods of prophylaxis and treatment with the newer vitamin preparations.

Out of the Test Tube. By Harry N. Holmes, Ph.D. Third edition. Cloth. Price, $3. Pp. 305, with 102 illustrations. New York: Emerson Books, Inc., 1941.

Scientists with a literary inclination and writers with a scientific bent have discovered that the public is avidly interested in what's going on in science. Unfortunately too many of these writers treat their subject matter in terms of melodramatic heroics, creating nothing more than a distorted caricature of the facts. They paint a picture of scientific research as something carried on at a high emotional pitch like stunt flying or a rescue at sea. The host of real scientists laboring from day to day, year in and year out, to uncover the stuffy but important little facts that serve as the backbone of scientific progress would appear, if the truth was known, as unimaginative dullards in comparison with the fictional heroes created by the popular writers' imaginations.

Fortunately for the public there are a few consummate artists among those who write on scientific subjects. In the forefront of these stands Dr. Harry N. Holmes. Chemistry is fortunate to have in its ranks a spokesman with his literary talents. In a direct, honest, clear, pictorial style he presents his science in a manner that is not only informative and educational but as entertaining as many books that are read for diversion. With "Out of the Test Tube" and Dr. Holmes's latest textbook on chemistry under his arm a high school or college student is prepared to learn chemistry and like it. While either of these volumes will stimulate his interest in the subject, there is grave peril that together they might be sufficient to make him want to be a chemist.

Medizinische Praxis: Sammlung für ärztliche Fortbildung. Herausgegeben von Prof. Dr. L. R. Grote, Direktor der Medizinischen Klinik des Rudolf-Hess-Krankenhauses Dresden, Prof. Dr. A. Fromme, Direktor der Chirurgischen Abteilung des Stadtkrankenhauses Dresden-Friedrichstadt, Prof. Dr. K. Warnekros, Direktor der Staatlichen Frauenklinik zu Dresden, und Prof. Dr. F. Lange, Direktor der Medizinischen Klinik des Stadtkrankenhauses Dresden-Friedrichstadt. Band XXX: Viruskrankheiten des Menschen. Von Professor Dr. med. E. Haagen, Abteilungsleiter am Institut für Infektionskrankheiten "Robert Koch," Berlin. Paper. Price, 10 marks. Pp. 162, with 26 illustrations. Dresden & Leipzig: Theodor Steinkopff, 1941.

The purpose of this volume as expressed by the author in his preface is to furnish a handbook on virus diseases for the practicing physician rather than one for the investigator and specialist. The volume has seriously attempted to meet this need, and the mode of presentation is such as to cover the major points of knowledge from both the technical and the practical side. There is some limitation in bibliography as well as in the points of view. The sections on therapy are essentially primitive and scarcely constitute the type of discussion one would anticipate for the practicing physician. Many of the therapeutic measures would not conform to accepted American standards. Nevertheless the volume has points of value in that it brings together discussions of most of the virus diseases which are of clinical importance. Arrangement by diseases is based more on clinical similarities than on an arbitrary classification of viruses. There is little reason at the present to recommend it for the American physician, since this information can be obtained from textbooks printed in this country, while the present volume will probably not be obtainable.

The Secret of Better Health. By Harold J. Reilly, D.Sc., President of the New York State Society of Physiotherapists. Cloth. Price, $2.50. Pp. 221, with illustrations. New York: Carlyle House, 1941.

This book apparently promises to give the layman all the advice necessary for good health and long life. It does not live up to its promise. Advice on diet and nutrition is always eagerly sought by the layman. In this book the reader is told that one of the cardinal points to remember in dieting is not "to mix protein and carbohydrates in one meal." Also that soybeans contain no fat. Other bits of misinformation are that "bunions actually are arthritis" and that hypertension is a symptom of old age. The chapter devoted to hypertension leads the reader to believe that the cause is principally overwork and overeating and that the necessary treatment is increasing the elimination through exercise and more roughage in the diet. In spite of the occasional suggestion to "see your doctor first," the reader is likely to try out first the advice given in the book. The book is written in a breezy, smart-cracking style which makes it easy to read; nevertheless it cannot be recommended by the physician for the lay reader.

Housing for Health: Papers Presented Under the Auspices of the Committee on the Hygiene of Housing of the American Public Health Association. Paper. Price, $1. Pp. 221, with 16 illustrations. New Haven: The Committee, 1941.

This collection of papers presented under the auspices of a committee on housing of the American Public Health Association is of primary interest to the health official or the housing expert. Subjects discussed include health and housing, health centers, health services, housing projects, heating and ventilation of a home, family life as the basis of home planning and the social effects of good housing, as well as others. The practicing physician is also concerned with these problems. In recent years the problem of heating and ventilation of the home has become a popular one. Like the subject of nutrition of the body, every one is talking about it, and the physician is frequently called on to act as referee. This book gives him excellent summaries on this topic, as well as the basic principles of healthful housing.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

WEATHER, CLIMATE AND RHEUMATISM

To the Editor:—The Board of Public Welfare is planning to erect within the next few years a new institution for the aged and infirm of the District of Columbia. Plans are already under way for the choice of a location for the new institution. Our present buildings are located on the banks of the Potomac River. The low altitude and the proximity of the river make for considerable dampness in the atmosphere surrounding the home. Fully 50 per cent of our inmates suffer with "rheumatism" in one form or another. Since I began my duties here last June I have heard many patients make the complaint "my rheumatism is much worse since I came down here." Since we have no facilities for adequate physical therapy it has been necessary for me to dispense salicylates "by the bushel." Would you kindly advise me as to the effect of atmospheric conditions on patients suffering with various types of chronic locomotor disease? Do you think it advisable to remove the institution to a higher and drier climate if such a measure entails a considerable expense?

Donat P. Cyr, M.D., Blue Plains, D.C.

ANSWER.—Since the days of Charcot and Garrod, dampness and chilling have been condemned by physicians and rheumatic patients as factors which predispose to the onset or aggravation of rheumatic diseases. Despite this general opinion there are few precise data to support it. Glover, who prepared a report on chronic arthritis for the British Ministry of Health (Report No. 52, Ministry of Health, London, 1928) regarded the idea as undoubtedly correct but was unable to find accurate supporting data. Other difficulties present themselves; chief among them is the vagueness of the term "rheumatism" and the fact that atmospheric conditions, weather and climate are made up of variable components—temperature, barometric pressure, atmospheric electricity, humidity and the like.

Probably the chief forms of "rheumatism" encountered in a home for the aged and infirm are osteoarthritis and its secondary fibrositis. Patients with these diseases often complain of the aggravating effects of damp and cold, but they do so less consistently than do patients with rheumatoid arthritis or with primary fibrositis. But such patients do not all act alike: although most patients with rheumatoid arthritis feel better when the temperature and barometer rise and when the humidity falls, some patients actually feel better in winter or with a falling barometer, and with cold, rather than warm, applications (Rentschler, E. B.; VanZant, F. R., and Rowntree, L. G.: Arthritic Pain in Relation to Changes in Weather, THE JOURNAL, June 15, 1929, p. 1995). Some patients are apparently disturbed more by changes in barometric pressure than by changes in temperature; others are more susceptible to alterations in humidity. In still other cases, alterations in atmospheric electricity are suspected as the cause of aggravation of symptoms. Rheumatic patients often feel better when they spend the winters in southern Arizona, probably because of the relative constancy in barometric pressure and in humidity and despite the notable fluctuations in temperature (fluctuations of as much as 50 degrees) which occur between the winter days and nights.

Debates on the influence of climate on the incidence of rheumatic diseases seem to be settled more by local patriotism than by scientific data, according to Tegner (*Am. Rheumat. Dis.* **1**:249 [Oct.] 1939), who noted that "rheumatism" was as common in the hills of Sweden as on the flat lands of Denmark and Holland; it is supposedly more common in the cold damp seaside parts of England, but in Scandinavian countries rheumatism sanatoriums are generally placed by the sea. Physicians in European countries with much coast line favor the sea air for their rheumatic patients, those in countries with little coast line regard the sea air as dangerous, and those in mountainous countries favor high altitude. Therefore Tegner concluded that in the temperate zone local climate is an unimportant factor in the incidence of chronic rheumatism. In a recent study made in southern Australia no certain relationship was found between the wetness of the season and the incidence of rheumatic fever, and the presence of creeks and rivers played no etiologic role. Nevertheless, in sections where dry heat prevailed there was less rheumatic fever than in those with combined dampness, high rainfall and relatively cold temperature (Report on the Epidemiology of Rheumatic Infection in South Australia, *M. J. Australia* **1**:461 [April 6] 1940). In New Haven, Conn., Paul found the highest incidence of rheumatic fever in the two wettest districts investigated (*Tr. A. Am. Physicians* **55**:290, 1940).

Faced with such conflicting and unsatisfactory data, those who would plan wisely the erection of an institution for the aged and infirm, who, chiefly because of their age, are subject to certain forms of rheumatism, will have to be guided by factors others than the proximity of a river. Are the inmates with "rheumatism" in the majority? Would it be cheaper to buy a new location away from damp and cold and build thereon a building without special air, temperature and humidity control, or would it be better to rebuild on grounds already owned (and perhaps conveniently situated) modern buildings in which an "artificial climate," suitable for rheumatic patients, can be provided by modern methods of house conditioning?

Since the problem in this particular institution seems to be a rather serious one which involves wise planning for the future, and since the new institution is not to be built for several years, it would appear that an excellent opportunity is afforded for a comprehensive and yet not too laborious study to be made relating the patients' voluntarily expressed symptoms with changes of humidity, temperature and barometric pressure. It is suggested that appropriate and not necessarily costly weather apparatus be set up in the hospital, that daily records of changes be kept (temperature, humidity, barometric pressure, atmospheric electricity) and that they be correlated with such data on aggravated symptoms and signs of rheumatism (including changes in blood sedimentation rates) as patients may exhibit through several changing seasons. This would constitute a valuable contribution to science and represent a far sighted use of public funds.

INJECTION SOLUTIONS FOR HERNIA

To the Editor:—I am using 10 per cent phenol in equal parts of glycerin and water to inject into hernias, using 2 to 5 cc. per injection. My problem is whether this material would be harmful if accidentally injected into the blood stream. Is this solution effective? What solution would you advise as being superior to the one I am using?

M.D., New Jersey.

ANSWER.—Solutions of phenol in the concentration described are extremely dangerous for use in the injection treatment of hernia. Many of the accidents of the injection treatment have been due to necrosis caused by varying strengths of phenol solution. Effective sclerosing solutions which do not contain phenol are on the market and consist principally of tannic acid or of sodium salts of certain fatty acids. Many also contain benzyl alcohol as an anesthetic agent. No preparation for use in the injection treatment of hernia has been recognized by the Council on Pharmacy and Chemistry because insufficient follow-up experience in the application of such a preparation has been gained. In a report (The Present Status of Injection Treatment of Hernia, THE JOURNAL, Aug. 17, 1940, p. 533) the Council pointed out that the injection method involves less danger of serious complications than does surgery only when employed in selected cases of hernia by those skilled in the injection of suitably standardized solutions of known composition and action. Apparently none of the proprietary preparations on the market are sufficiently well standardized to insure uniformity of composition and activity and should therefore be used only with full cognizance of the dangers involved. Reports in the literature indicate that of the available preparations those consisting of a solution of the sodium salt of certain fatty acids are perhaps less dangerous than those which contain more powerful sclerosing agents.

SULFATHIAZOLE FOR NASAL SPRAY AND SINUSITIS

To the Editor:—I have been using 5 per cent sulfathiazole in distilled water as a nasal spray in chronic sinusitis and upper respiratory infections. Despite using a nonmetallic atomizer (DeVilbiss number 251) and keeping the solution away from the light in a dark glass bottle, I find that this solution becomes dark in a few days and a bit irritating. Can you tell me any method of increasing the stability (it has been suggested to me that by slightly acidifying the solution or keeping it in the icebox this can be done)? When the solution becomes discolored is it less active or more toxic? Are there any contraindications to the use of the fresh solution as a nasopharyngeal spray?

M.D., Pennsylvania.

ANSWER.—It is assumed that the inquirer is referring to a 5 per cent solution of sodium sulfathiazole in distilled water, because sulfathiazole is not soluble to the extent of 5 per cent. If this assumption is correct, then any attempt to acidify slightly the solution of the sodium salt would result in the precipitation of sulfathiazole from the solution when the point of neutrality was reached and, as the solution was made acid, the drug would tend to go into solution again. For that reason it would not be practical to increase the stability of the solution of the sodium salt of sulfathiazole by acidifying it. Discolored solutions of the sulfonamide drugs should never be used, because it means that chemical changes have taken place in the drug which, under certain conditions, render it less active and possibly more toxic.

It has been shown recently that 5 per cent solutions of the sodium salt of sulfathiazole may be definitely irritating to the nasal mucous membrane and, under certain conditions, may cause such damage to the tissues that necrosis and sloughing will result. For this reason it is the general opinion that these solutions should be used with great care.

DOES THE SKIN BREATHE?

To the Editor:—One of a group of teachers has been teaching that "the skin breathes," while the rest do not regard the skin as an organ of breathing and others would like to know if there is any scientific evidence for considering the skin an organ of respiration. They are aware that it is so in the frog during hibernation. They realize that respiration goes on in all living cells, in muscles, kidneys and epithelium, and that each living cell takes oxygen from the blood and lymph and returns carbon dioxide to the lymph and ultimately to the blood. They do not, to that account, speak of kidneys or muscles as breathing organs. They think of the skin as obtaining its oxygen from the blood and lymph and not from the atmosphere. It is realized that the expression "the skin breathes" or "let your skin breathe" has been much used of late in a loose, almost a poetic, way. To a biology teacher this seems like an unfortunate misstatement. I imagine that persons using it often cannot explain what they mean by breathing and are using the word because it sounds good in connection with soaps or clothing. If they are referring to the elimination of carbon dioxide during "insensible perspiration," which is mentioned in some physiology textbooks, elimination would seem to be the better word. To suppose that air enters the sweat glands seems far fetched. I have not been able to find out whether this so-called breathing of the skin is associated with the promulgation of some idea supposed to be hygienic; very likely it is. If hygienic advice is to be given on the basis of supposed fact, the person giving such advice should make sure of the fact underlying it. Such generalizations as "the less clothing you wear the better," which I have heard laymen confidently assert, may do considerable harm, especially among women and children, and are probably the result of teaching by persons who have not been careful enough about so-called facts. I ask your assistance.

L. M. Dithridge, M.D., New York.

ANSWER.—According to tradition the concept of the skin breathing arose many centuries ago when a nobleman in an effort to adorn his young and beautiful wife painted her skin with a coating of gilt paint. Her prompt death with symptoms of suffocation is said to have given rise to this notion. Its modern use is an atavism that should be discarded. What actually happened in the case of the unfortunate lady was interference with loss of heat and water from the skin.

Most gases and urinary constituents are eliminated to some degree by the skin, the total amount varying with different persons and conditions. As a rule, however, most substances are absorbed by the skin as readily as they are eliminated. For instance, if a body area is immersed in a high concentration of carbon dioxide considerable quantities may be absorbed. Perhaps a better way to state the case would be to say that the skin has the capacity to exchange metabolites, but it is incorrect and misleading to say that it breathes.

The comment on the statement that "the less clothing you wear the better" is highly pertinent. Like all generalities, it holds only for certain conditions and circumstances.

WINTER BRONCHITIS

To the Editor:—Please discuss the treatment of the so-called "winter bronchitis," that is chronic hypertrophic vesicular fibroid pulmonary emphysema.

M.D., Alabama.

ANSWER.—Unfortunately there is no specific treatment for this condition. It is a stage in the evolution of a condition that has had its origin in the past and will likely continue to progress. Much may be done in its amelioration. First determine the presence or absence of a causative factor, which may be removed. Cardiovascular disease may be treated; tumors of the lung may sometimes be removed; aneurysms of the aorta do not offer such a good prospect, nor does silicosis. Bronchiectatic cavities are sometimes the source of recurrent infection. Treatment of these is unsatisfactory unless the bronchiectasis is confined to a single lobe, in which case lobectomy may be considered. Infections about the mouth, tonsils and paranasal sinuses must be controlled if possible. Remaining treatment is largely symptomatic.

Protection from extreme changes in temperature is desirable but not always possible. A dry, warm climate is best for patients with abundant sputum and a warm climate by the seashore for those with a dry cough. The use of expectorants sometimes assists in the raising of thick viscid sputum. Steam inhalations, with or without medication, are soothing but have little additional value. If dyspnea and cyanosis exist, oxygen inhalations are helpful. If bronchial spasm occurs epinephrine or theophylline with ethylene diamine will give some relief.

The use of autogenous vaccines has been suggested, but there is little convincing evidence that they have value.

DINITROPHENOL CATARACTS

To the Editor:—A patient who took dinitrophenol from September 1934 to April 1935 lost 35 pounds (16 Kg.) in this time. She took three tablets a day. She also took it from April 1935 to November without any loss of weight. In October 1935 cataracts appeared in both eyes. These progressed until in December she had only light projection and light perception and on December 26 was operated on for cataract extraction. On March 3, 1936 the other eye was operated on. She had two accidents and lost the vision in the first eye. In the other eye she had 20/20 vision with correction twenty-six days after the operation. On Feb. 16, 1937 the eye was the same. On July 31, 1939, with the best correction, she could get only 20/40 vision. On Dec. 27, 1939 the right eye was needled at the hospital. On Feb. 6, 1940, with her correction, she got 20/20 vision. On April 14, 1941, with the best correction, she got 20/30. On May 12 the best vision obtainable was 20/30. This vision remained about 20/30 until recently. In September the best vision obtainable was 20/100. The refraction of the eye has changed little since May 1941. I am especially interested in learning whether you have any records of dinitrophenol cataracts follow-up to know if there is any degeneration of the retina and what the expected eventual result may be.

M.D., Pennsylvania.

ANSWER.—In all the cases of dinitrophenol cataract that have been reported to date there has not been any accompanying retinal degeneration, and after eventual removal of the cataract good vision has been maintained. From the description of this case it would appear that some complicating factor must be present to account for the decreased vision. Probably careful perimetric studies of the peripheral as well as the central fields might reveal the cause.

IMMEDIATE TREATMENT OF POISONING

To the Editor:—Several of my patients are enrolled in the American Red Cross first aid course with a view to becoming instructors in first aid. The textbook used in this course is "American Red Cross First Aid Textbook" (corrected reprint, 1940). On pages 192 and 193 of this manual the first step in the treatment of poisoning is described as the administration of an emetic, such as soapsuds, dishwater and salt water. This treatment is prescribed for all forms of poisoning. It is my understanding that in general an emetic should not be given until after the administration of demulcent when the poison consists of a corrosive substance, such as acids, alkalies and bichloride of mercury. Are these contraindications still considered valid? If so it would seem important that students of first aid under the Red Cross should be informed of these exceptions to the general rule.

M.D., New York.

ANSWER.—As stated in the American Red Cross First Aid Textbook (1940), two main points are to be remembered in the treatment of poisoning: (1) Dilute; (2) wash out. A poison diluted with a large volume of fluid is not absorbed as rapidly as is poison in a more concentrated form. Furthermore, it is easier to induce vomiting if the stomach is full. When a poison is removed it can do no further damage. More specific directions follow with the admonition not to waste time hunting an antidote.

It is to be remembered that these instructions are intended for the trained lay person and not for the physician. They call for treatment which is practically always available and which can be used without danger of causing further damage. If specific antidotes were always at hand they could be used, but it is felt that the directions given are safe and adequate and should be followed, pending the arrival of the physician.

TEMPERATURE OF PATIENT AND CALCULATION OF BASAL METABOLISM

To the Editor:—When determining results of a basal metabolism test is it necessary to correct for subnormal temperatures as well as for those above normal?

Draper Lang, M.D., Mason City, Iowa.

ANSWER.—It is unwise in routine clinical practice to pay much attention to the rate of metabolism when the temperature deviates much from the standard normal. Abnormalities associated with the disease responsible for the change in temperature may affect the rate of metabolism as well as the change in temperature itself.

While some patients exhibit a slightly subnormal level of temperature most of the time, it is not customary in routine clinical practice to make any correction for this variation.

NEURITIS OF TROCHLEAR NERVE AFTER INFLUENZA

To the Editor:—In Queries and Minor Notes in The Journal, Dec. 6, 1941, page 2018, in reply to a query concerning neuritis of the trochlear nerve after influenza, it is stated that "Jello" at least once daily should be consumed for its aminoacetic acid constituent. This is an error which frequently crops up in the literature and is based on a failure to distinguish between gelatin per se and gelatin desserts. "Jello" is the trade name of one particular brand of gelatin dessert and as such consists of only about 10 per cent gelatin, the remainder being largely sugar. Obviously the consumption of this product will provide but little aminoacetic acid; what is intended is pure gelatin, which contains approximately 25 per cent of this amino acid.

N. R. Gotthelfer, Grayslake, Ill.